SERVICE MANUAL
ORIGINAL

COLOUR DATA DISPLAY

Chassis Series 80P-G14

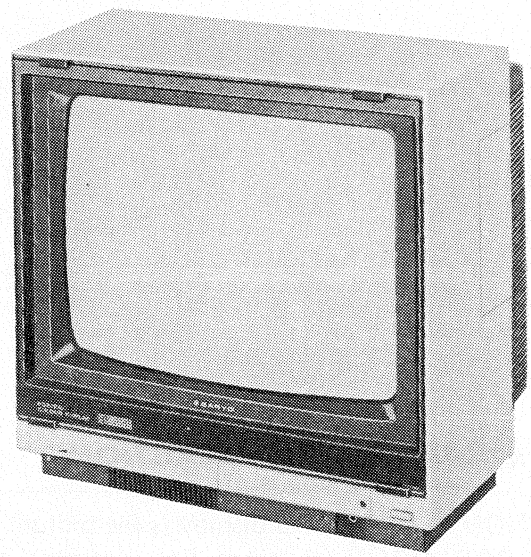
Service Ref. No. is printed in the rating plate affixed to the cabinet back.

SANYO

Model CD3185A

SERVICE REF.No. CD3185A-00

FOR PARTS OR SERVICE. ALWAYS GIVE COMPLETE SERVICE REF. NUMBER.



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For detail information (circuit analysis and troubleshooting techniques), refer to the training manual of 80P chassis.

WM-10653 Aug./'83 SI Printed in Japan (BMRF)

SANYO ELECTRIC CO., LTD.
SANYO ELECTRIC TRADING CO., LTD.

SAFETY PRECAUTIONS

1. An isolation transformer should be connected in the power line between the set and the AC line when a service is performed on the primary of the converter transformer of the set.
2. Comply with all caution and safety-related notes provided on cabinet back, inside the cabinet, on the chassis or the picture tube.
3. When replacing a chassis in the cabinet, always be certain that all the protective devices are installed properly, such as, control knobs, adjustment covers or shields, barriers, isolation resistor-capacitor networks etc.

   Before returning any colour data display to the customer, the service technician must be sure that it is completely safe to operate without danger of electrical shock.

X-RADIATION PRECAUTION

The primary source of X-RADIATION in colour data display is the picture tube. The picture tube is specially constructed to limit X-RADIATION emissions. For continued X-RADIATION protection, the replacement tube must be the same type as the original including suffix letter. Excessive high voltage may produce potentially hazardous X-RADIATION. To avoid such hazards, the high voltage must be maintained within specified limit. Refer to this service manual, high voltage adjustment for specific high voltage limits. If high voltage exceeds specified limits, take necessary corrective action. Carefully follow the instructions for +B1 volt power supply adjustment, and high voltage adjustment to maintain the high voltage within the specified limits.

PRODUCT SAFETY NOTICE

Product safety should be considered when a component replacement is made in any area of a set. Components indicated by mark ⚠ in the parts list and the schematic diagram designate components in which safety can be of special significance. It is particularly recommended that only parts designated on the parts list in this manual be used for component replacement designated by mark ⚠ No deviations from resistance wattage or voltage ratings may be made for replacement items designated by mark ⚠

SPECIFICATIONS

Power source	AC220/230/240V, 50Hz	
Power consumption	53W	
Input terminal	21P CENELEC standard	
Input signals	R.G.B.	1.0Vp-p analog, 75 ohms
	Sync.	0.3 – 3.0Vp-p H + V composite 75 ohms
	Video	1.0Vp-p PAL composite, 75 ohms
	Audio	440mVrms, 47K ohms
Audio output	1.0W, 10% distortion	
Speaker	9 x 5 cm, 8 ohms	

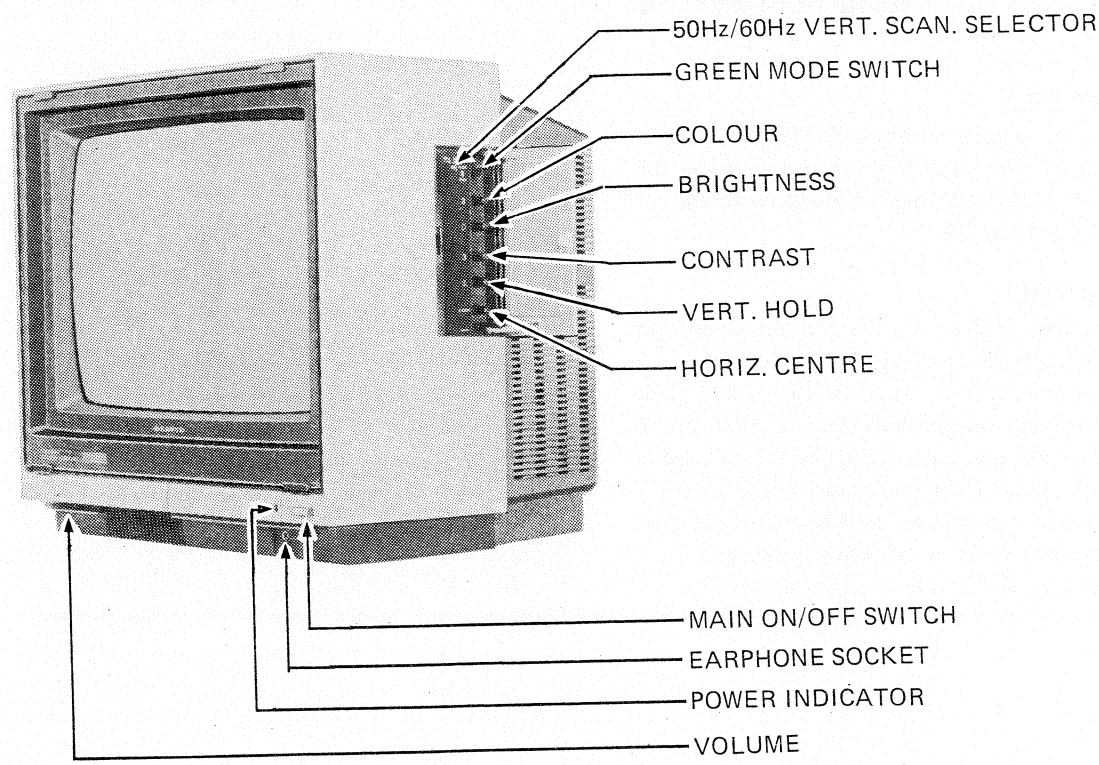
Picture tube	37cm diagonal, 90 degree Type No. 370KRB22
High voltage	21kV at Zero beam
Semiconductors	23 Transistors 5 ICs 27 Diodes
Dimensions	Width 366mm Height 361mm Depth 384mm
Weight	11kg

SUMMARY

14" COMPACT COLOUR DATA DISPLAY

All solid state circuitry with 5 ICs and 23 transistors for stable quality, less power consumption and high reliability. Simplified chassis construction with 1 main circuit board for easy access and servicing. In-line gun, slotted mask black matrix picture tube with 90° deflection angle. Convergence-free tube system. Instant-Start for instant picture and sound in standby mode. Input terminals are 21P-CENELEC type connector and two RCA connectors.

A green mode switch, a vertical scanning selector, and an RGB/VIDEO selector are provided.



CHASSIS DISCRIPTION

Described below are the characteristics of this model. Adequate knowledge about will enhance the understanding of the chassis and help the service engineer in the execution of his work.

SOUND:
The audio amplifier IC is employed in this chassis. The preamplifier, the sound drive, and the output amplifier are all incorporated into LA4220.

VIDEO & CHROMA:
In the video and chroma circuitry of the former 79P chassis, signals were processed by the M51381P IC of the video circuitry and the TA7193P IC of the chroma circuitry. In the new 80P chassis (this chassis), all signals of the video and chroma circuitry are processed by one IC, M51393P.

SYNC., VERT. OSC. & HORIZ. OSC.:
The deflection IC for this chassis is the newly developed LA7800R. Comparison with the LA1460 used in the 79P chassis reveals the following points:

1. It is a 16-pin DIL. (The LA1460 was a 22-pin DIL.)
2. A 12V stabilization circuit is built in.
3. There is a smaller number of parts in the sync-separation stage.

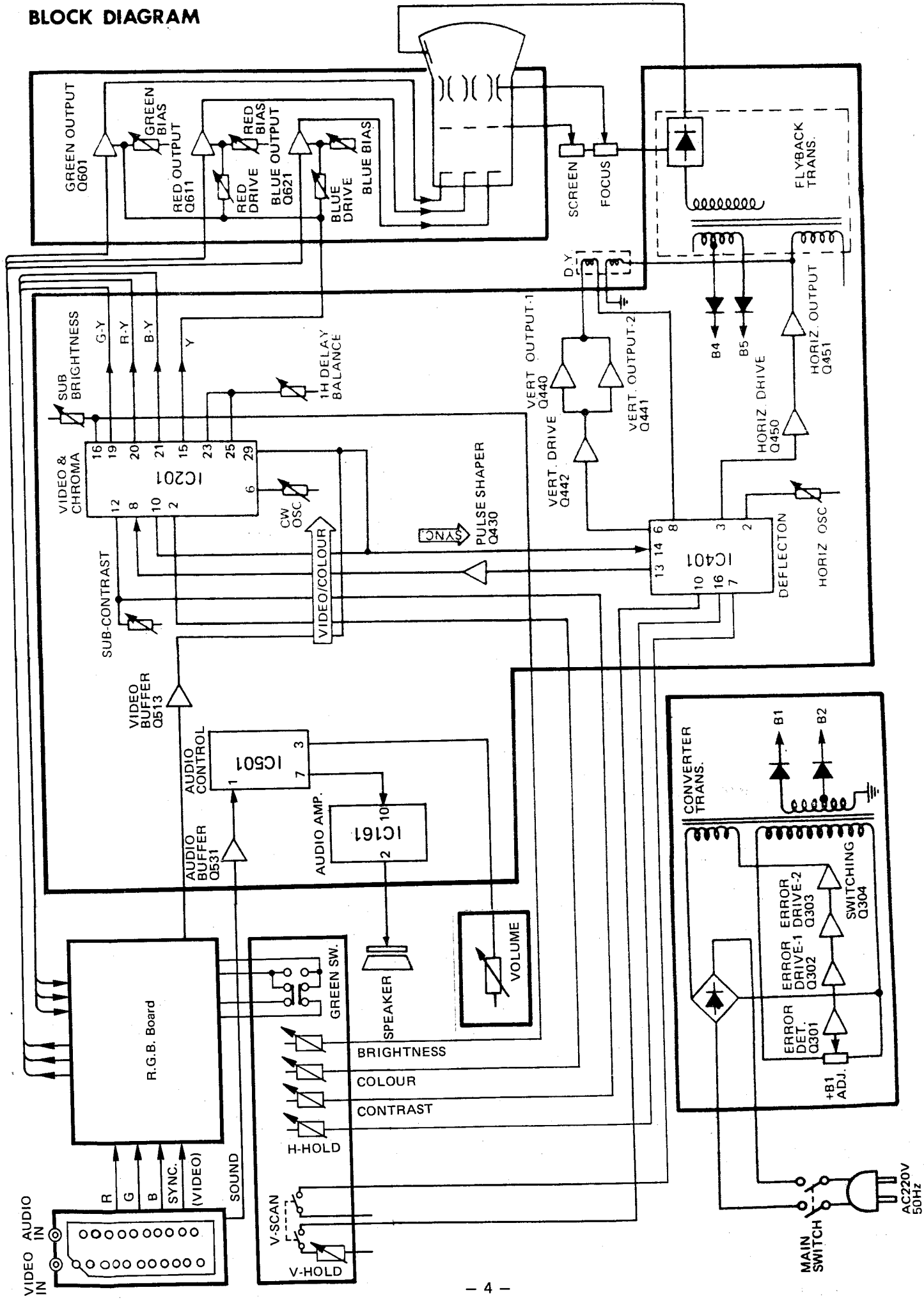
VERTICAL OUTPUT:
The main feature of the vertical output circuitry of the 80P chassis is that it employs a two-power-source pump-up system. This system is employed in order to eliminate the unnecessary electric power which is supplied in the first half of the scanning period in the conventional one-power-source system.

HORIZONTAL DRIVE:
The horizontal-drive circuit current-amplifies the signal generated by the horizontal-oscillation stage inside the deflection IC (IC401), and provides sufficient switching for horizontal-output transistor Q451.

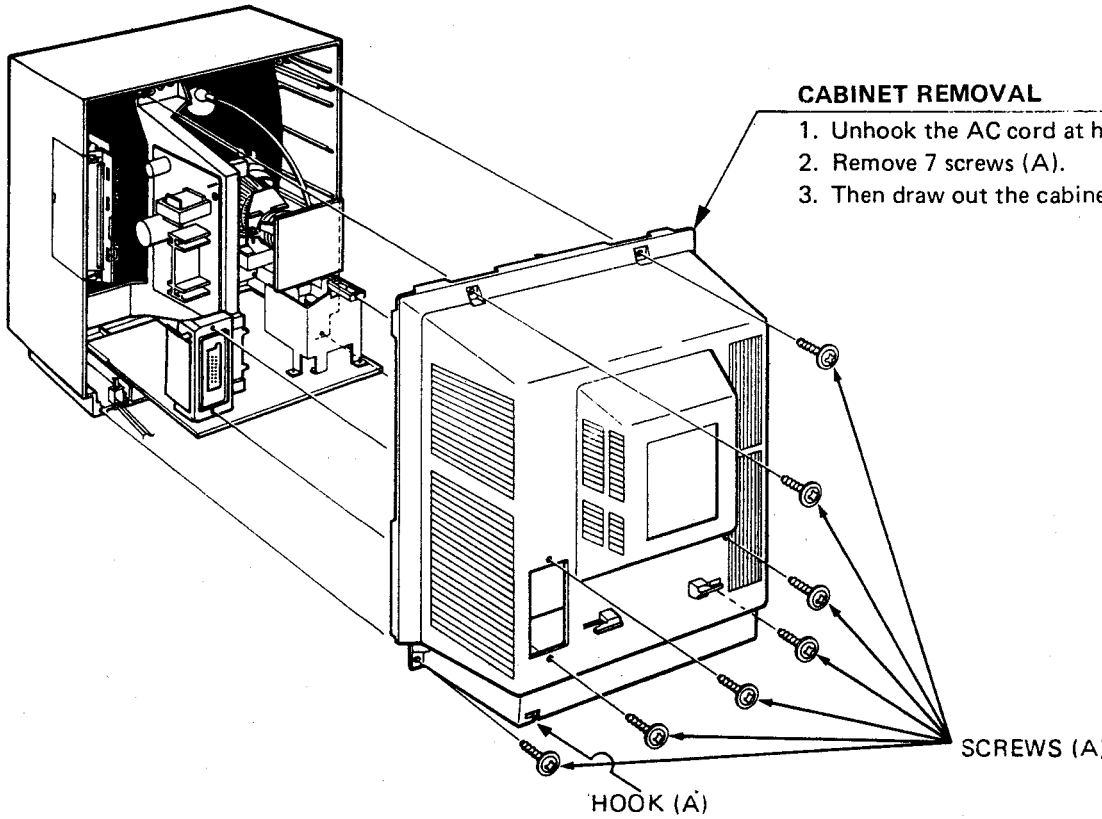
HORIZONTAL OUTPUT:
The output transistor utilized in the horizontal output circuitry is a built-in damper diode type of transistor.
The FBT (flyback transformer) is a built-in high-voltage block in which the high-voltage block and the FBT are an integrated unit. The 5th harmonic tuning system is used in the FBT. The high-voltage pulses produced inside the FBT are rectified by the double-voltage rectifier circuit (doubler system) in order to obtain the specified high voltage.
The screen voltage is taken from the focus resistor.

POWER SUPPLY:
The power-supply circuitry of the 80P chassis (this chassis), because it is the switching regulator type and adopts the converter system, reduces the amount of power loss, and is the insulated type. It was especially designed with the objective of receiving approval as an IEC standard class II type.

BLOCK DIAGRAM

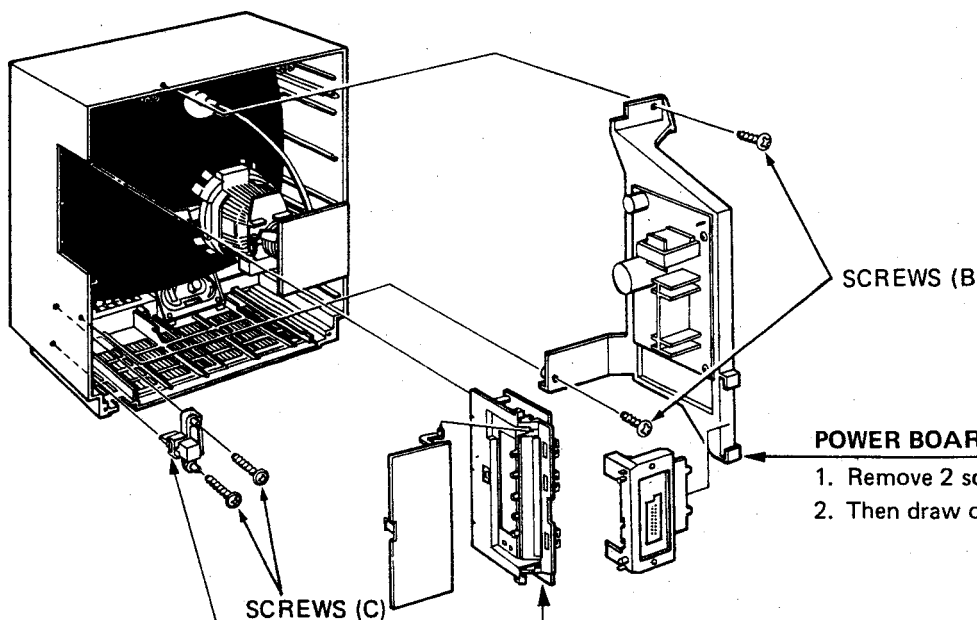


DISASSEMBLY



CABINET REMOVAL

1. Unhook the AC cord at hook (A).
2. Remove 7 screws (A).
3. Then draw out the cabinet.



POWER BOARD HOLDER REMOVAL

1. Remove 2 screws (B).
2. Then draw out this holder.

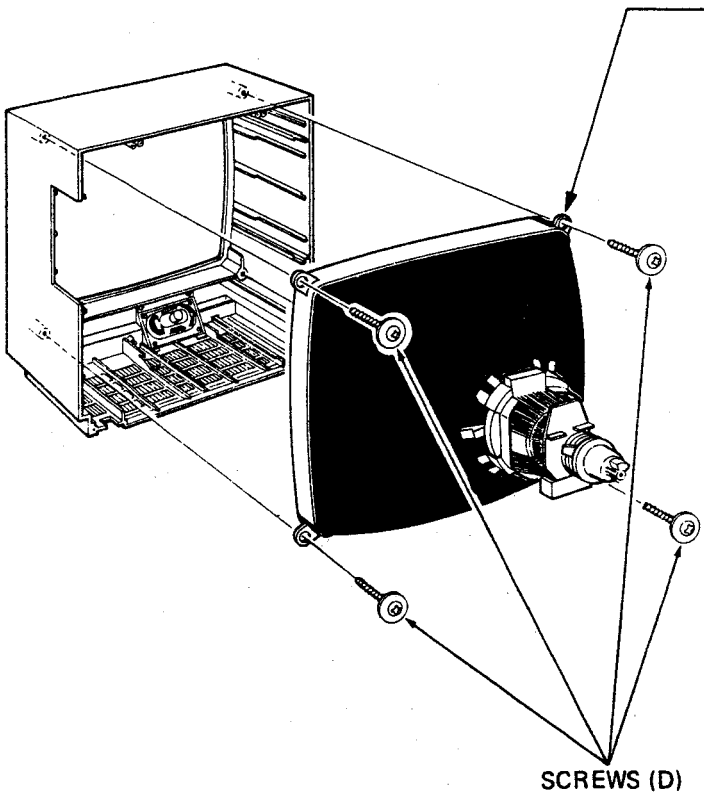
FRONT CONTROL BASE REMOVAL

1. Remove 2 screws (C)
2. Then draw out this bracket.

SIDE CONTROL BASE REMOVAL

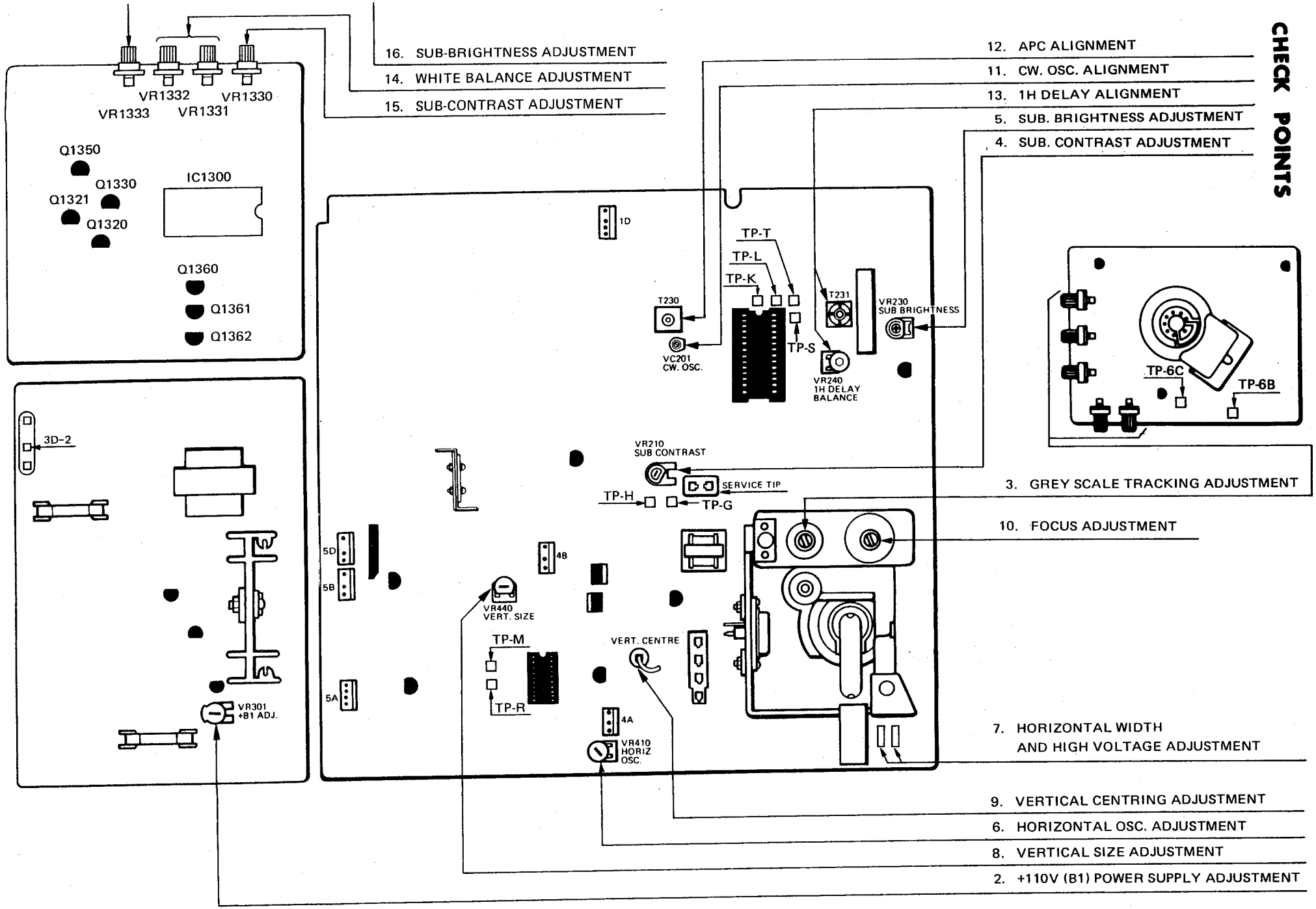
1. Pull out this bracket.

PICTURE TUBE REMOVAL



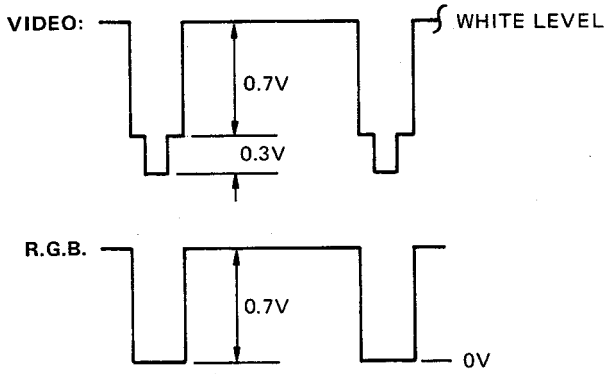
Caution; Do not disturb the deflection yoke or magnet assembly on CRT neck.
Care must be taken to keep these assemblies intact.
Discharge picture tube by shorting the anode connection to chassis ground. (Not cabinet or other mounting parts).

1. Remove the cabinet back and chassis.
2. Place the cabinet face down on a soft surface.
3. Remove 4 screws (D).
4. Gently lift out the picture tube and place it on a soft surface.
5. Install replacement picture tube in reverse order.


16. SUB-BRIGHTNESS ADJUSTMENT
14. WHITE BALANCE ADJUSTMENT
15. SUB-CONTRAST ADJUSTMENT
12. APC ALIGNMENT
11. CW. OSC. ALIGNMENT
13. 1H DELAY ALIGNMENT
5. SUB. BRIGHTNESS ADJUSTMENT
4. SUB. CONTRAST ADJUSTMENT
3. GREY SCALE TRACKING ADJUSTMENT
10. FOCUS ADJUSTMENT
7. HORIZONTAL WIDTH AND HIGH VOLTAGE ADJUSTMENT
9. VERTICAL CENTRING ADJUSTMENT
6. HORIZONTAL OSC. ADJUSTMENT
8. VERTICAL SIZE ADJUSTMENT
2. +110V (B1) POWER SUPPLY ADJUSTMENT
VR1332
VR1330
VR1333
VR1331
Q1350
Q1330
Q1321
Q1320
IC1300
Q1360
Q1361
Q1362
3D-2
VR301
+B1 ADJ.
1D
TP-T
TP-L
TP-K
T230
VC201
CW. OSC.
TP-S
T231
VR230
SUB BRIGHTNESS
VR240
1H DELAY
BALANCE
TP-6C
TP-6B
VR210
SUB CONTRAST
SERVICE TIP
TP-H
TP-G
5D
5B
5A
4B
4A
VR440
VERT. SIZE
TP-M
TP-R
VERT. CENTRE
VR410
HORIZ
OSC.

SERVICE CONTROL ADJUSTMENTS

1. STANDARD INPUT SIGNALS



2. +110V (+B1) POWER SUPPLY ADJUSTMENT

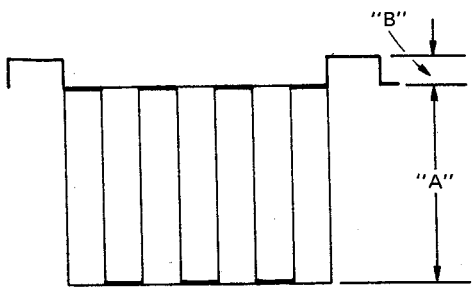
1. Tune the colour bar pattern.
2. Set brightness and contrast to maximum, and colour to normal.
3. Connect voltmeter to terminal "3D-2" on power board.
4. Adjust VR301 for +110V.

3. GREY SCALE TRACKING ADJUSTMENT

1. Set brightness and contrast to maximum, and colour to minimum.
2. Disconnect service tip.
3. Set red (VR612) and blue (VR622) drive controls to mid-range.
4. Set red (VR611), green (VR601) and blue (VR621) bias controls to minimum.
5. Adjust screen control to obtain just visible one coloured line.
6. Advance each bias control to obtain just visible three coloured lines.
7. Reconnect service tip.
8. Adjust red and blue drive controls alternately to produce normal black and white picture.
9. Check for proper grey scale tracking at all brightness levels.

4. SUB-CONTRAST ADJUSTMENT

1. Tune the checker flag pattern.
2. Set contrast to maximum and colour to minimum.
3. Connect oscilloscope to test point "TP-6C".
4. Connect a short lead between test point "TP-G" and ground.
5. Set brightness for 5Vp-p at "B" as illustrated below.
6. Adjust VR210 for 80Vp-p at "A" as illustrated below.



5. SUB-BRIGHTNESS ADJUSTMENT

NOTE: +110V power supply, AGC and grey scale tracking should be adjusted before attempting this adjustment.

1. Tune the white raster pattern.
2. Set brightness to maximum, contrast and colour to minimum.
3. Connect D.C. meter between test points "TP-H" (+ lead) and "TP-G" (– lead).
4. Adjust VR230 for 0.14V.

6. HORIZONTAL OSCILLATION ADJUSTMENT

1. Connect a short jumper between test points "TP-M" and "TP-R".
2. Adjust VR410 to momentarily synchronize picture.

7. HORIZONTAL WIDTH AND HIGH-VOLTAGE ADJUSTMENT

NOTE: +110V power supply, AGC and grey scale tracking should be adjusted before attempting this adjustment.

1. Tune the colour bar pattern.
2. Set brightness and contrast to maximum and colour to minimum.
3. Check picture width. If picture is too wide or narrow, cut or short the leads (AJ1, AJ2). In case the lead is cut, horizontal width will be decreased and the lead is shorted, it will be increased.
4. Connect a high-voltage meter to anode on picture tube.
5. Check high-voltage. High-voltage must measure 19KV ±1.0KV. If high-voltage is lower than 18KV, clip the leads AJ1, AJ2. (By attempting this, the high-voltage is increased approx. 0.5KV.)

Remarks: This adjustment affects sub-brightness. Therefore, recheck sub-brightness adjustment.

8. VERTICAL SIZE ADJUSTMENT

1. Tune the colour bar pattern.
2. Adjust VR440 to obtain proper picture.

9. VERTICAL CENTRING ADJUSTMENT

1. Set vertical and horizontal hold controls for a properly synchronized picture.
2. Vertical centring can be adjusted by connecting vertical tip to anyone of three terminals.

10. FOCUS ADJUSTMENT

Adjust focus control on the right side of the chassis for well scanning lines.

CIRCUIT ALIGNMENTS

CHROMA ALIGNMENTS

11. CW. OSC. ALIGNMENT

1. Tune the colour bar pattern.
2. Set brightness, contrast and colour controls to maximum.
3. Short between test points "TP-K" and "TP-L" with a short clip.
4. Connect a short lead between test point "TP-S" and "TP-T".
5. Adjust VC201 to obtain colour synchronized picture.

12. APC ALIGNMENT

1. Tune the colour bar pattern.
2. Connect oscilloscope to test point "TP-6B" on CRT board.
3. Set brightness, contrast and colour controls to maximum.
4. Adjust T230 for maximum amplitude of "A" in figure-1.

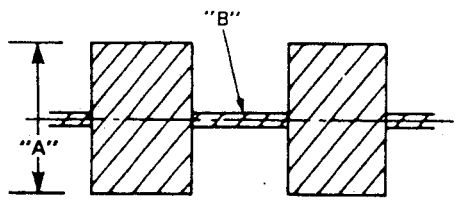


Figure-1 (Vert.)

13. 1H DELAY ALIGNMENT

1. Turn the colour bar pattern.
2. Connect oscilloscope to test point "TP-6B" on CRT board.
3. Set brightness, contrast and colour controls to maximum.
4. Adjust VR240 for minimum amplitude of "B" as shown in figure-1.
5. Adjust T231 to obtain each 1H waveform (amplitude) for the same as shown in figure-2.

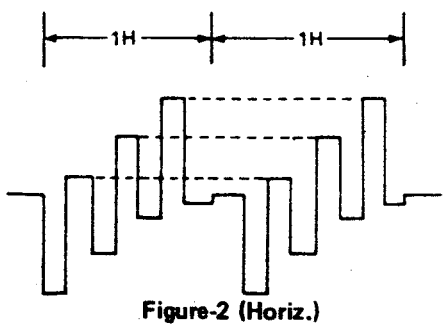


Figure-2 (Horiz.)

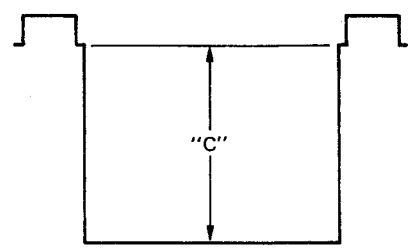
R.G.B. INPUT ADJUSTMENTS

14. R.G.B. WHITE BALANCE ADJUSTMENT

1. Tune the circular pattern.
2. Set brightness, contrast and colour controls to maximum.
   Set RGB/VIDEO switch to "VIDEO" position.
3. Disconnect service tip.
4. Check for proper grey scale tracking.
5. Turn the RGB/VIDEO switch to "RGB" position.
6. Adjust screen control to obtain just visible one doted line.
7. Adjust red (VR1331) and blue (VR1332) adjust controls to obtain just visible three coloured lines.
8. Turn the RGB/VIDEO switch to "VIDEO" position.
9. Adjust screen control to obtain just visible one doted line.
10. Reconnect service tip.

15. SUB-CONTRAST ADJUSTMENT

1. Tune the white raster pattern.
2. Set brightness, contrast and colour controls to maximum.
   Set RGB/VIDEO switch to "RGB" position.
3. Connect oscilloscope to test point "TP-6C".
4. Adjust VR1330 for 60Vp-p at "C" as illustrated bellow.



16. SUB-BRIGHTNESS ADJUSTMENT

1. Tune the white raster pattern.
2. Set brightness, contrast and colour controls to maximum.
   Set RGB/VIDEO switch to "RGB" position.
3. Connect D.C. meter between test points "TP-H" (+lead) and "TP-G" (—lead).
4. Adjust VR1333 for 0.7V.

SET UP PICTURE TUBE ADJUSTMENTS

CAUTION; Convergence and Purity have been factory aligned. Do not attempt to tamper with these alignments. However, the effects of adjacent set components, or replace picture tube or deflection yoke may require the need to readjust purity and convergence. If adjustment is required the adjustments should be made in the following sequence.

PURITY ADJUSTMENT

1. Place the picture tube face north or south and demagnetize the picture tube and set using an external degaussing coil. When replacing picture tube or deflection yoke, mount deflection yoke and purity-convergence magnets assembly properly, see figure 1.
2. Turn Red and Blue guns off to provide only Green raster by rotating Red and Blue Bias controls fully counter-clockwise. Slowly rotate Green Bias control clockwise to produce Green raster.
3. Loosen the screw holding the Deflection Yoke and slide the Deflection Yoke backward as far as possible, and remove the 3 D.Y. spacers.
4. Rotate the spread the Tabs of the two Purity Magnets to centre the vertical green belt in the picture screen. The Purity Magnets are also adjusted to obtain vertical centering of the raster.
5. Slowly slide the Deflection Yoke forward until a uniform green screen is obtained.
6. Check the purity of the red and blue screens for uniformity, turn off other colours to check this (use bias controls). Readjust the yoke position if necessary until all screens are pure.
7. Adjust each Bias control and screen control to obtain white raster. Refer to Gray Scale Adjustment. If part of the picture screen is coloured, adjust the Deflection Yoke position forward or backward slightly.
8. Fasten the screw of the Deflection Yoke. Adjust Convergence next.

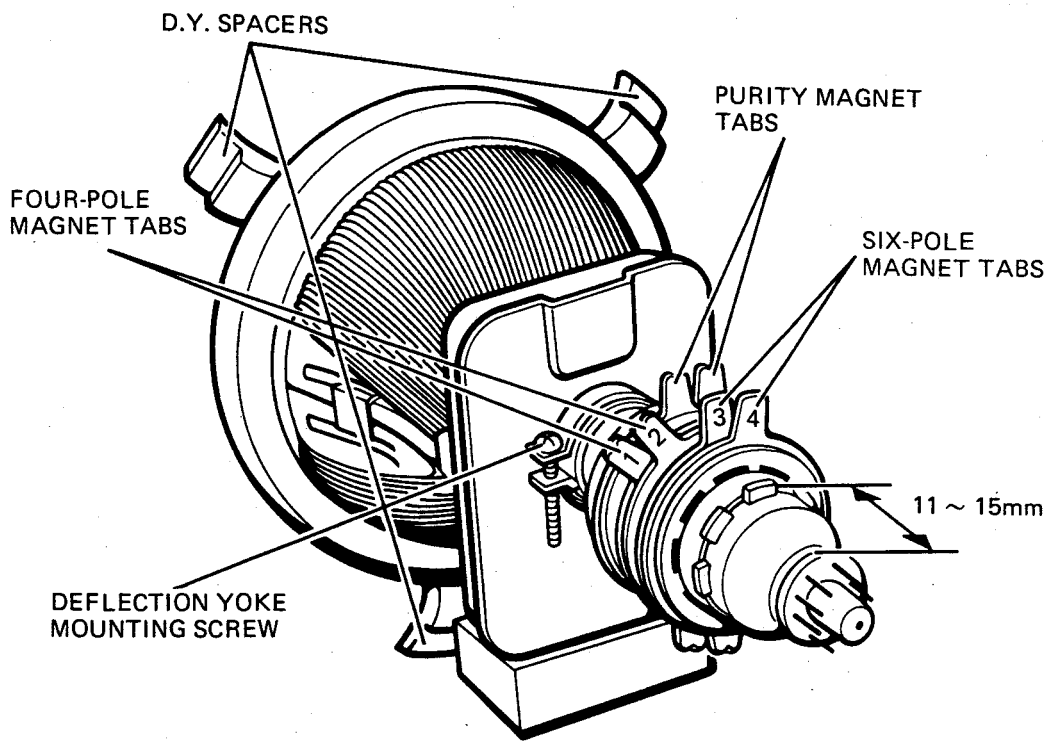


Figure 1 - PURITY AND CONVERGENCE MAGNETS

CONVERGENCE ADJUSTMENT

1. Use a dot-crosshatch pattern signal.
2. Turn Red and Blue guns on and turn off Green gun, refer to Purity Adjustment step 2. Adjust the angle between the Tabs of the Four Pole Magnet 1 and 2, and superimpose the Red and Blue vertical lines in the centre area of the picture screen. Refer to figure 2.
3. Keeping the mutual angle of the Tabs of the Four Pole Magnet turn them together to superimpose the Blue and Red horizontal lines in the centre area of the picture screen. Refer to figure 2.
4. Turn Green gun on and adjust Six Pole Magnet 3 and 4 so that the Green line superimposes on the Red/Blue lines. This is the same procedure used in steps 2 and 3. Refer to figure 3.

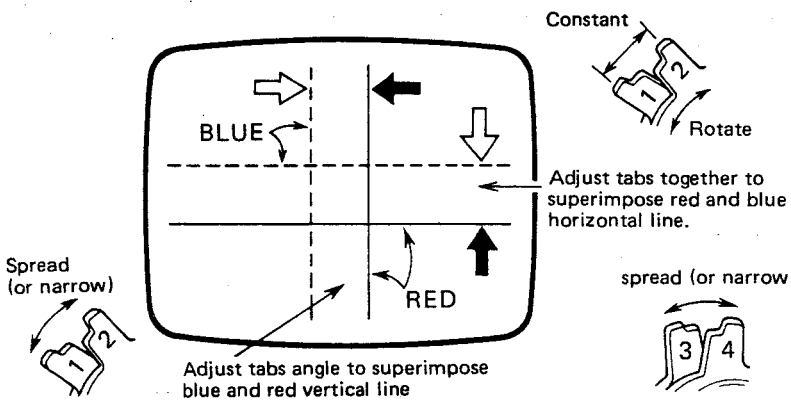


Figure 2 - BLUE AND RED LINE MOVEMENT

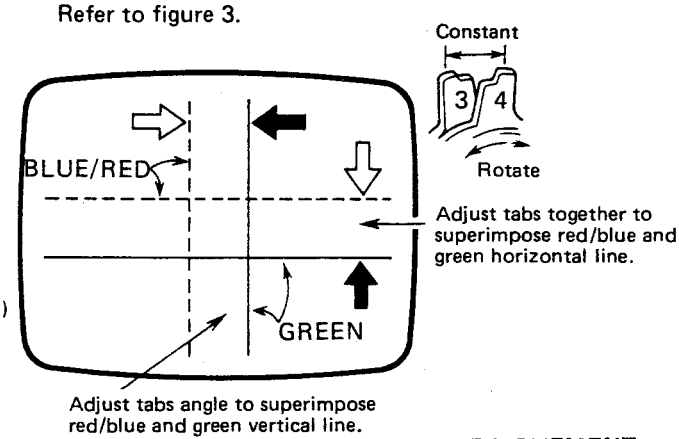
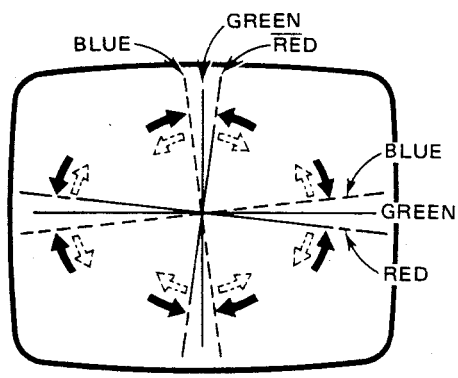
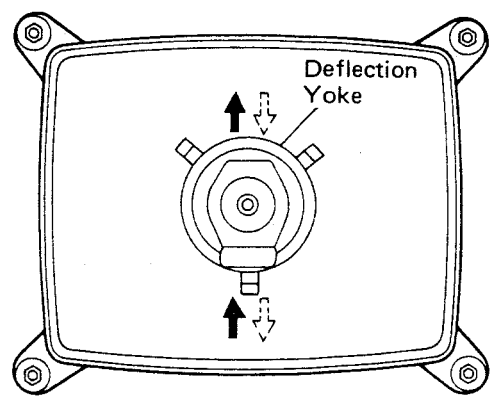


Figure 3 - BLUE/RED AND GREEN LINE MOVEMENT

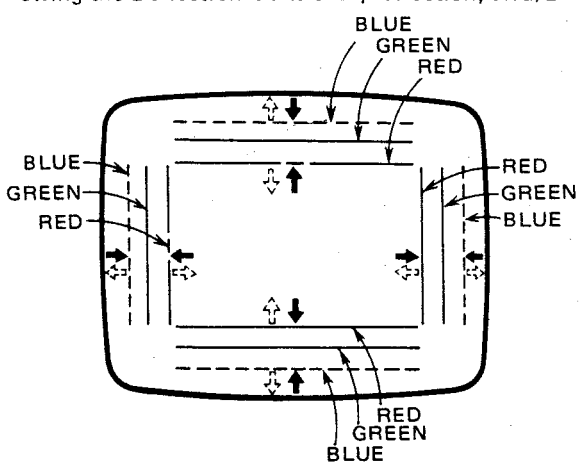
OUTER AREA CONVERGENCE

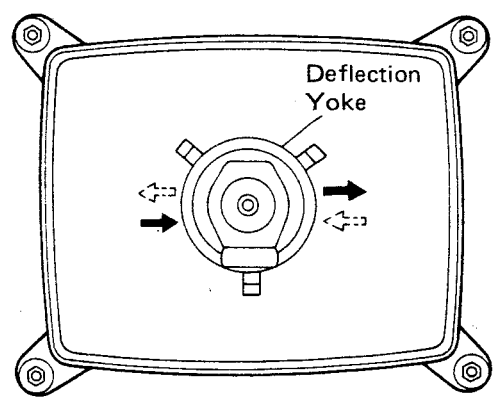
If mis-convergence on the outer area exits, as follow adjustment.





Swing the Deflection Yoke the ⬅ direction, Red/Blue lines on the screen move the ⬅ direction.
Swing the Deflection Yoke the ⇦ direction, Red/Blue lines on the screen move the ⇦ direction.

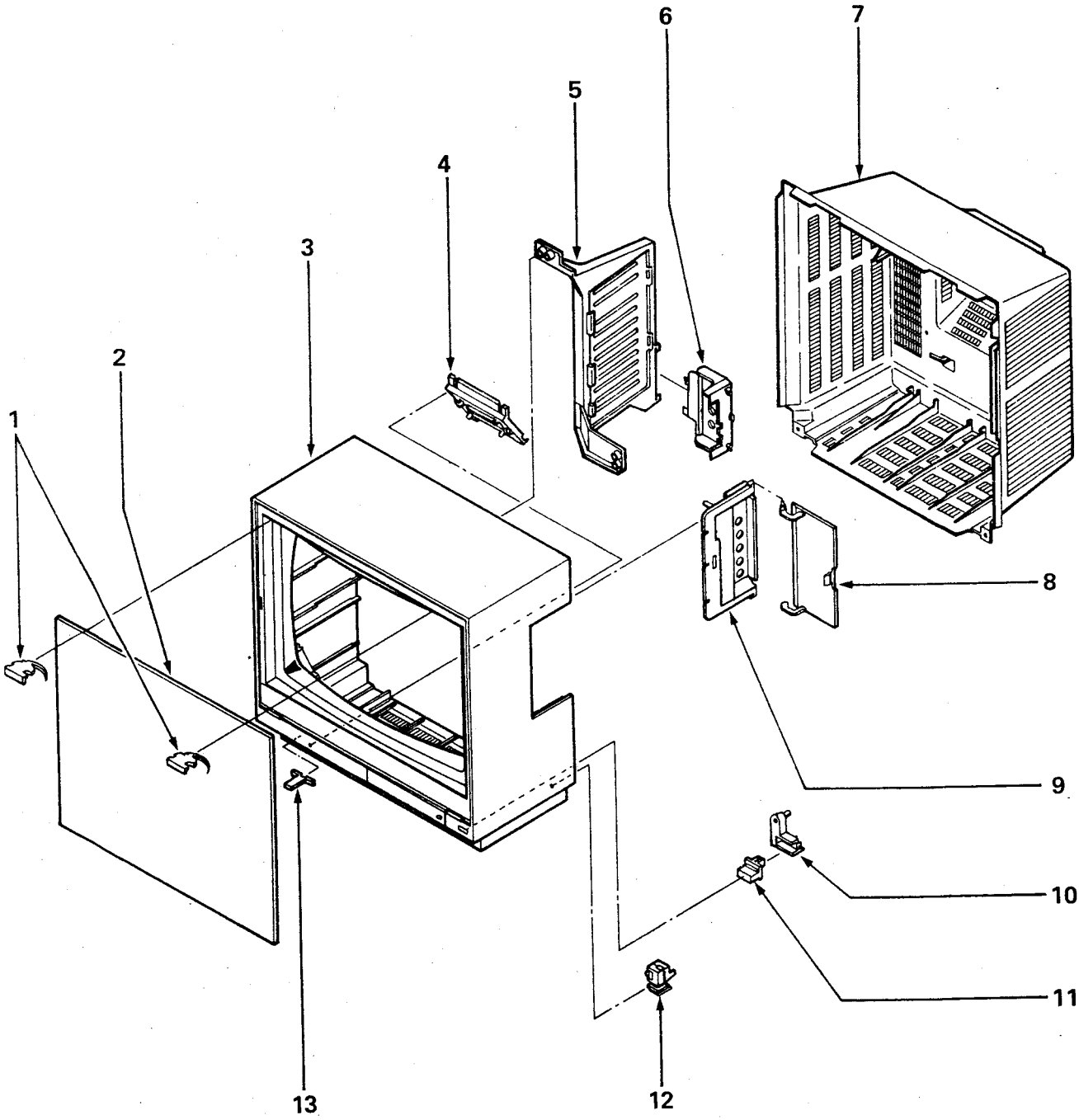




Swing the Deflection Yoke the ⬅ direction, Red/Blue lines on the screen move the ⬅ direction.
Swing the Deflection Yoke the ⇦ direction, Red/Blue lines on the screen move the ⇦ direction.
To fasten the Deflection Yoke, Insert and fix the D.Y. spacer.

CABINET PARTS LIST

NOTE: Parts order must contain Service Ref. No., Key No., Part No., and Description



Key No.	Part No.	Description
1.	3151191	Filter Holder
2.	3750013	Smoked Filter
3.	HY0132	Escutcheon Ass'y
4.	3151207	Speaker Holder
5.	3M00148	Power Board Holder
6.	HY0133	Input Terminal Ass'y

Key No.	Part No.	Description
7.	HY0134	Cabinet Ass'y
8.	3M00107B	Door
9.	HY0096	Side Control Ass'y
10.	3M00645	Control Base
11.	3M00105	Main Switch Button
12.	3M00103	AC Cord Holder
13.	3151206	Volume Knob

CHASSIS ELECTRICAL PARTS LIST

PRODUCT SAFETY NOTICE

PRODUCT SAFETY SHOULD BE CONSIDERED WHEN A COMPONENT REPLACEMENT IS MADE IN ANY AREA OF A SET COMPONENTS INDICATED BY A MARK ⚠ IN THIS PARTS LIST AND THE CIRCUIT DIAGRAM SHOW COMPONENTS WHOSE VALUE HAVE SPECIAL SIGNIFICANCE TO PRODUCT SAFETY. IT IS PARTICULARLY RECOMMENDED THAT ONLY PARTS SPECIFIED ON THE FOLLOWING PARTS LIST BE USED FOR COMPONENTS REPLACEMENT POINTED OUT BY THE MARK.

NOTE: Part order must contain Service Ref. No. Ref. No., Part No. and Description

UG0031 (MAIN BOARD BMRC)

TRANSISTORS

Ref. No.	Part No.	Description
Q430	Q5053F	2SC536(F)
	OR Q5053G	2SC536(G)
Q440	Q6613O	2SC2483(O)
	OR Q6613R	2SC2483(R)
	OR Q6548ER	2SC2073R
	OR Q6548DR	2SC2073R
Q441	Q6614O	2SA1195(O)
	OR Q6614R	2SA1195(R)
	OR Q6586DR	2SA940R
	OR Q6586ER	2SA940R
Q442	Q6803R	2SC2551(R)
	OR Q6803O	2SC2551(O)
Q450	Q6541ZM	2SC2229M
	OR Q6531ZM	2SC2228M
Q451	Q6623Z	2SD868(Z)
Q481	Q5053F	2SC536(F)
	OR Q5053G	2SC536(G)
Q513	Q5077E	2SA608(E)
	OR Q5102R	2SA564(R)
	OR Q5102Q	2SA564(Q)
	OR Q5077G	2SA608(G)
	OR Q5102P	2SA564(P)
	OR Q5077F	2SA608(F)
Q531	Q5077E	2SA608(E)
	OR Q5102P	2SA564(P)
	OR Q5102R	2SA564(R)
	OR Q5102Q	2SA564(Q)
	OR Q5077G	2SA608(G)
	OR Q5077F	2SA608(F)

INTEGRATED CIRCUITS

Ref. No.	Part No.	Description
IC161	Q7228	LA4220, AUDIO AMP.
IC201	Q7239	M51393P
IC401	Q7227	LA7800, DEFLECTION
IC502	QC0058	AN5262, SOUND CONTROL

CAPACITORS

Ref. No.	Part No.	Description
C160	CEFEM100	ELECTROLYTIC,10MF,25V
C161	CEDEM221	ELECTROLYTIC,220MF,16V
C162	CEFEM330	ELECTROLYTIC,33MF,25V
C163	CCHAK101	CERAMIC,100PF,+-10%,50V
C164	CFHSK103	MYLAR FILM,0.01MF,+-10%,50V
	OR CFHRK103	MYLAR FILM,0.01MF,+-10%,50V
C165	CEFEM470	ELECTROLYTIC,47MF,25V
C166	CEDEM471	ELECTROLYTIC,470MF,16V
C167	CFHRK154	MYLAR FILM,0.15MF,+-10%,50V
	OR CFHSK154	MYLAR FILM,0.15MF,+-10%,50V
C168	CEFEM4R7	ELECTROLYTIC,4.7MF,25V
C201	CCHJZ103	CERAMIC,0.01MF,+80%-20%,50V
C202	CCHJZ103	CERAMIC,0.01MF,+80%-20%,50V
C203	CEHEM1R0	ELECTROLYTIC,1MF,50V
C204	CCHJZ103	CERAMIC,0.01MF,+80%-20%,50V
C205	CCHBJ680	CERAMIC,68PF,+-5%,50V
C207	CCHBJ560	CERAMIC,56PF,+-5%,50V
C211	CCHJZ103	CERAMIC,0.01MF,+80%-20%,50V
C212	CCHBJ150	CERAMIC,15PF,+-5%,50V
C213	CCHBJ100	CERAMIC,10PF,+-5%,50V
C214	CEDEM100	ELECTROLYTIC,10MF,16V
C216	CCHBC3R0	CERAMIC,3PF,+-0.25PF,50V
C217	CEBEM470	ELECTROLYTIC,47MF,10V
C218	CEHEM1R0	ELECTROLYTIC,1MF,50V
C221	CEHEMR47	ELECTROLYTIC,0.47MF,50V
C230	CCHJZ103	CERAMIC,0.01MF,+80%-20%,50V
C231	CCHJZ103	CERAMIC,0.01MF,+80%-20%,50V
C232	CCHBJ820	CERAMIC,82PF,+-5%,50V
C233	CEDEM100	ELECTROLYTIC,10MF,16V
C235	CCHJZ103	CERAMIC,0.01MF,+80%-20%,50V
C236	CCHJZ103	CERAMIC,0.01MF,+80%-20%,50V
C237	CCHBJ101	CERAMIC,100PF,+-5%,50V
C238	CCHJZ103	CERAMIC,0.01MF,+80%-20%,50V
C239	CCHJZ103	CERAMIC,0.01MF,+80%-20%,50V
C240	CFHBJ474	MYLAR FILM,0.47MF,+-5%,50V
	OR CFHBK474	MYLAR FILM,0.47MF,+-10%,50V
C241	CFHRK223	MYLAR FILM,0.022MF,+-10%,50V
	OR CFHSK223	MYLAR FILM,0.022MF,+-10%,50V

Ref. No.	Part No.	Description
C244	CEHEMR47	ELECTROLYTIC,0.47MF,50V
C245	CCHJZ103	CERAMIC,0.01MF,+80%-20%,50V
C246	CCHBJ181	CERAMIC,180PF,+-5%,50V
C247	CCHBJ390	CERAMIC,39PF,+-5%,50V
C248	CCHBJ680	CERAMIC,68PF,+-5%,50V
C249	CCHJZ103	CERAMIC,0.01MF,+80%-20%,50V
C252	CCHBJ151	CERAMIC,150PF,+-5%,50V
C401	CTFEK105	ELECTROLYTIC,1MF,+-10%,25V
C402	CFHSK103	MYLAR FILM,0.01MF,+-10%,50V
	OR CFHRK103	MYLAR FILM,0.01MF,+-10%,50V
C403	CFHRK683	MYLAR FILM,0.068MF,+-10%,50V
	OR CFHSK683	MYLAR FILM,0.068MF,+-10%,50V
C404	CEHEM2R2	ELECTROLYTIC,2.2MF,50V
C405	CCHFK561	CERAMIC,560PF,+-10%,50V
C406	CEDEM101	ELECTROLYTIC,100MF,16V
C407	CFHSK683	MYLAR FILM,0.068MF,+-10%,50V
	OR CFHRK683	MYLAR FILM,0.068MF,+-10%,50V
C408	CFHSK223	MYLAR FILM,0.022MF,+-10%,50V
	OR CFHRK223	MYLAR FILM,0.022MF,+-10%,50V
C409	CFHRK563	MYLAR FILM,0.056MF,+-10%,50V
	OR CFHSK563	MYLAR FILM,0.056MF,+-10%,50V
C410	CEHEM1R0	ELECTROLYTIC,1MF,50V
C411	CFHRK103	MYLAR FILM,0.01MF,+-10%,50V
	OR CFHSK103	MYLAR FILM,0.01MF,+-10%,50V
C412	C9212	MYLAR FILM,5600PF,+-5%,50V
	OR C9212A	MYLAR FILM,5600PF,+-5%,50V
C420	CCHJZ103	CERAMIC,0.01MF,+80%-20%,50V
C422	CEFFN1R0	ELECTROLYTIC,1MF,25V
C431	CCHCJ121	CERAMIC,120PF,+-5%,50V
C432	CCSAK820	CERAMIC,82PF,+-10%,500V
C433	CEDEM470	ELECTROLYTIC,47MF,16V
C440	C7201	ELECTROLYTIC,4.7MF,250V
C441	CCHFK472	CERAMIC,4700PF,+-10%,50V
C442	CNLRK333	POLYPROPYLENE,0.033MF,+-10%,200V
C443	CFHRJ223	MYLAR FILM,0.022MF,+-5%,50V
	OR CFHSJ223	MYLAR FILM,0.022MF,+-5%,50V
C444	CTDEK225	ELECTROLYTIC,2.2MF,+-10%,16V
C445	CEHEM561	ELECTROLYTIC,560MF,50V
C446	CEHEMR47	ELECTROLYTIC,0.47MF,50V
C447	CEHEM100	ELECTROLYTIC,10MF,50V
C448	CCSFK561	CERAMIC,560PF,+-10%,500V
C450	CCSFK102	CERAMIC,1000PF,+-10%,500V
C451	CEKEA4R7	ELECTROLYTIC,4.7MF,160V
⚠ C452	CC1WJ331	CERAMIC,330PF,+-5%,3KV
	OR CC1VJ331	CERAMIC,330PF,+-5%,3KV
⚠ C453	CC1WJ331	CERAMIC,330PF,+-5%,3KV
	OR CC1VJ331	CERAMIC,330PF,+-5%,3KV
⚠ C454	CNZDJ562	POLYPROPYLENE,5600PF,+-5%,2KV
	OR CN9RJ562	POLYPROPYLENE,5600PF,+-5%,1600V
	OR CN9BJ562	POLYPROPYLENE,5600PF,+-5%,1600V
C455	CCSFK331	CERAMIC,330PF,+-10%,500V
C459	CFISK682	MYLAR FILM,6800PF,+-10%,100V
C460	CFMBJ564	MYLAR FILM,0.56MF,+-5%,250V
C461	CFMBJ474	MYLAR FILM,0.47MF,+-5%,250V
C462	CEHEM101	ELECTROLYTIC,100MF,50V
C463	CEFEM102	ELECTROLYTIC,1000MF,25V
C464	CEMEA100	ELECTROLYTIC,10MF,250V

Ref. No.	Part No.	Description
C465	CEFEM100	ELECTROLYTIC,10MF,25V
C466	CNZDJ472	POLYPROPYLENE,4700PF,+-5%,2KV
	OR CN9RJ472	POLYPROPYLENE,4700PF,+-5%,1600V
	OR CN9BJ472	POLYPROPYLENE,4700PF,+-5%,1600V
C467	CEDEM471	ELECTROLYTIC,470MF,16V
C468	CCSFK471	CERAMIC,470PF,+-10%,500V
C469	CCHFK471	CERAMIC,470PF,+-10%,50V
C481	CCHBJ560	CERAMIC,56PF,+-5%,50V
C513	CCHJP103	CERAMIC,0.01MF,+100%-0%,50V
C521	CEDEM101	ELECTROLYTIC,100MF,16V
C531	CEHEM1R0	ELECTROLYTIC,1MF,50V
C547	CEHEM1R0	ELECTROLYTIC,1MF,50V
C548	CEDEM100	ELECTROLYTIC,10MF,16V
C549	CEHEM1R0	ELECTROLYTIC,1MF,50V
C551	CFHSK562	MYLAR FILM,5600PF,+-10%,50V
	OR CFHRK562	MYLAR FILM,5600PF,+-10%,50V

RESISTORS

R124	RFACJ122	CARBON,1200 OHM,+-5%,1/4W
R150	RFACJ274	CARBON,270K OHM,+-5%,1/4W
R155	RFACJ274	CARBON, 270K OHM,+-5%, 1/4W
R160	RFACJ103	CARBON,10K OHM,+-5%,1/4W
R161	RFACJ103	CARBON,10K OHM,+-5%,1/4W
R162	RFACJ683	CARBON,68K OHM,+-5%,1/4W
R182	RFACJ393	CARBON,39K OHM,+-5%,1/4W
⚠ R190	RNBPJ270	METALIZED CARBON,27 OHM,+-5%,1/2W
R200	RFACJ393	CARBON,39K OHM,+-5%,1/4W
R201	RFACJ183	CARBON,18K OHM,+-5%,1/4W
R203	RFACJ392	CARBON,3900 OHM,+-5%,1/4W
R204	RFACJ122	CARBON,1200 OHM,+-5%,1/4W
R205	RFACJ391	CARBON,390 OHM,+-5%,1/4W
R206	RFACJ154	CARBON,150K OHM,+-5%,1/4W
R207	RFACJ152	CARBON,1500 OHM,+-5%,1/4W
R208	RFACJ333	CARBON,33K OHM,+-5%,1/4W
R209	RFACJ472	CARBON,4700 OHM,+-5%,1/4W
R210	RFACJ152	CARBON,1500 OHM,+-5%,1/4W
R215	RFACJ151	CARBON,150 OHM,+-5%,1/4W
R217	RFACJ102	CARBON,1K OHM,+-5%,1/4W
R218	RFACJ224	CARBON,220K OHM,+-5%,1/4W
R220	RFACJ471	CARBON,470 OHM,+-5%,1/4W
R222	RFACJ102	CARBON,1K OHM,+-5%,1/4W
R231	RFACJ183	CARBON,18K OHM,+-5%,1/4W
R234	RFACJ103	CARBON,10K OHM,+-5%,1/4W
R237	RFACJ153	CARBON,15K OHM,+-5%,1/4W
R238	RFACJ332	CARBON,3300 OHM,+-5%,1/4W
R239	RFACJ332	CARBON,3300 OHM,+-5%,1/4W
R240	RFACJ332	CARBON,3300 OHM,+-5%,1/4W
R242	RFACJ221	CARBON,220 OHM,+-5%,1/4W
R243	RFACJ221	CARBON,220 OHM,+-5%,1/4W
R244	RFACJ225	CARBON,2200K OHM,+-5%,1/4W
R247	RFACJ561	CARBON,560 OHM,+-5%,1/4W
R248	RFACJ681	CARBON,680 OHM,+-5%,1/4W
R252	RFACJ334	CARBON,330K OHM,+-5%,1/4W
R255	RFACJ122	CARBON,1200 OHM,+-5%,1/4W
R401	RFACJ123	CARBON,12K OHM,+-5%,1/4W
R402	RFACJ124	CARBON,120K OHM,+-5%,1/4W
R403	RFACJ123	CARBON,12K OHM,+-5%,1/4W

Ref. No.	Part No.	Description
R404	RFACJ222	CARBON,2200 OHM,+-5%,1/4W
R405	RFACJ154	CARBON,150K OHM,+-5%,1/4W
R406	RFACJ471	CARBON,470 OHM,+-5%,1/4W
R408	RFACJ123	CARBON,12K OHM,+-5%,1/4W
R409	RFACJ473	CARBON,47K OHM,+-5%,1/4W
R410	RR2FJ682	OXIDE METALIZED,6800 OHM,+-5%,2W
R412	RFACJ103	CARBON,10K OHM,+-5%,1/4W
R413	RFACJ682	CARBON,6800 OHM,+-5%,1/4W
R420	RFACJ472	CARBON,4700 OHM,+-5%,1/4W
R422	RFACJ101	CARBON,100 OHM,+-5%,1/4W
R424	RR1FJ562	OXIDE METALIZED,5600 OHM,+-5%,1W
R431	RFACJ153	CARBON,15K OHM,+-5%,1/4W
R432	RFACJ562	CARBON,5600 OHM,+-5%,1/4W
R433	RFACJ562	CARBON,5600 OHM,+-5%,1/4W
R434	RFACJ154	CARBON,150K OHM,+-5%,1/4W
R435	RFACJ333	CARBON,33K OHM,+-5%,1/4W
R440	RR3HJ272	OXIDE METALIZED,2700 OHM,+-5%,3W
R441	RR1FJ103	OXIDE METALIZED,10K OHM,+-5%,1W
R443	RFACJ563	CARBON,56K OHM,+-5%,1/4W
R444	RFACJ681	CARBON,680 OHM,+-5%,1/4W
R445	RFBPJ5R6	CARBON,5.6 OHM,+-5%,1/2W
R446	RR1FJ392	OXIDE METALIZED,3900 OHM,+-5%,1W
R448	RFACJ563	CARBON,56K OHM,+-5%,1/4W
R449	RFACJ221	CARBON,220 OHM,+-5%,1/4W
R450	RFACJ331	CARBON,330 OHM,+-5%,1/4W
R451	RFACJ272	CARBON,2700 OHM,+-5%,1/4W
R452	RR2FJ562	OXIDE METALIZED,5600 OHM,+-5%,2W
R453	RFACJ4R7	CARBON,4.7 OHM,+-5%,1/4W
R460	RY8WK150	WIRE WOUND,15 OHM,+-10%,8W
⚠ R461	RNBPJ102	METALIZED CARBON,1K OHM,+-5%,1/2W
⚠ R462	RNBPJ5R6	METALIZED CARBON,5.6 OHM,+-5%,1/2W
⚠ R463	RN1PJ3R9	METALIZED CARBON,3.9 OHM,+-5%,1W
⚠ R464	RNBPJ100	METALIZED CARBON,10 OHM,+-5%,1/2W
R465	RF2EJ225	CARBON,2200K OHM,+-5%,2W
R466	RFACJ221	CARBON,220 OHM,+-5%,1/4W
R467	RFACJ334	CARBON,330K OHM,+-5%,1/4W
⚠ R471	RN1PJ331	METALIZED CARBON,330 OHM,+-5%,1W
R474	RFACJ103	CARBON,10K OHM,+-5%,1/4W
R481	RFACJ563	CARBON,56K OHM,+-5%,1/4W
R482	RFACJ224	CARBON,220K OHM,+-5%,1/4W
R483	RFACJ222	CARBON,2200 OHM,+-5%,1/4W
R484	RFACJ222	CARBON,2200 OHM,+-5%,1/4W
R490	RFACJ562	CARBON,5600 OHM,+-5%,1/4W
R518	RFACJ471	CARBON,470 OHM,+-5%,1/4W
⚠ R521	RNBPJ390	METALIZED CARBON,39 OHM,+-5%,1/2W
R531	RFACJ102	CARBON,1K OHM,+-5%,1/4W
R532	RFACJ104	CARBON,100K OHM,+-5%,1/4W
R533	RFACJ224	CARBON,220K OHM,+-5%,1/4W
R534	RFACJ681	CARBON,680 OHM,+-5%,1/4W
R535	RFACJ102	CARBON,1K OHM,+-5%,1/4W
R546	RFACJ392	CARBON,3900 OHM,+-5%,1/4W
R551	RFACJ103	CARBON,10K OHM,+-5%,1/4W
VARIABLE RESISTORS		
VR210	G0122XXT	100K OHM, B
	OR G0262XXB	100K OHM, B
VR230	G0097XXT	30K OHM, B
	OR G0260XXB	30K OHM, B
VR240	GF0014XM	3K OHM, B
	OR GF0014XT	3K OHM, B
VR410	G0151	5K OHM, B
VR440	G0228XXB	20K OHM, B
	OR G0228XXM	20K OHM, B
TRANSFORMERS		
T230	S3832	PHASE
T231	S5036	MATCHING
T450	A5050	HORIZ. DRIVE
	OR A5050A	HORIZ. DRIVE
⚠ T460	FD0012	FLYBACK
	OR F1172	FLYBACK
COILS		
L201	LDAK181	PEAKING, 180UH
L202	LDAK5R6	PEAKING, 5.6UH
L210	L7346	DELAY LINE
L230	LPAJ220	PEAKING, 22UH
L231	L7309	1H DELAY LINE
	OR L7309A	1H DELAY LINE
L232	LPAJ8R2	PEAKING, 8.2UH
L233	LPAJ820	PEAKING, 82UH
L235	LPAJ5R6	PEAKING, 5.6UH
L238	LDAK100	PEAKING,10UH
L239	LDAK100	PEAKING,10UH
L240	LDAK100	PEAKING,10UH
L450	L7133	FILTER, 3.3UH
	OR L7133B	FILTER, 3.3UH
	OR L7133A	FILTER, 3.3UH
L460	A7028	LINEARITY
DIODES		
D210	E1121R	1S1555
	OR E1324R	1S2076
	OR E1229R	1S2473
D211	ED0020	EQA02-06Z, 6V, ZENER
D213	E1229R	1S2473
	OR E1324R	1S2076
	OR E1121R	1S1555
D230	E1216ZG	EQB01-12, ZENER, 12V
D231	E1121R	1S1555
	OR E1229R	1S2473
	OR E1324R	1S2076
D401	E1324R	1S2076
	OR E1229R	1S2473
	OR E1121R	1S1555
D411	E1121R	1S1555
	OR E1229R	1S2473
	OR E1324R	1S2076
D430	E1121R	1S1555

Ref. No.	Part No.	Description
D431	E1324R	1S2076
	OR E1229R	1S2473
	OR E1121R	1S1555
D432	ED0020	EQA02-06Z, 6V, ZENER
D440	E1442R	S5277B
D441	E1121R	1S1555
	OR E1229R	1S2473
	OR E1324R	1S2076
D442	E1121R	1S1555
D443	E1031RXT	1S188TV
D444	E1031RXT	1S188TV
D460	E1794R	C44-04
	OR E1786R	EU2
D461	E1786R	EU2
	OR E1794R	C44-04
D462	E1791R	B43-04
	OR E1533R	EU-1
D481	E1324R	1S2076
	OR E1229R	1S2473
	OR E1121R	1S1555
D521	E1216ZG	EQB01-12, ZENER, 12V

MISCELLANEOUS

IC201A	E3374	SOCKET, 30P
⚠ FOVR	R0155XS	FOCUS RESISTOR
	OR R0155XH	FOCUS RESISTOR
KFOVR	E3160	TERMINAL SOCKET FOR FOCUS BLOCK
KHC	E4659	3P, HOUSING
KHCST2	E3257	SOCKET, TERMINAL
KSV	E6052	HOUSING, 2P
KVC	E6051	HOUSING, 1P
KVS	E4659	3P, HOUSING
KVSST2	E3257	SOCKET, TERMINAL
K1A	E3903	PLUG, 5P HOUSING
K1B	E3926	2P, HOUSING
K1D	E3902	PLUG, 4P HOUSING
K2R	E4643	HOUSING, 5P
K2RST5	E3257	SOCKET, TERMINAL
K4B	E3901	3P HOUSING PLUG
K5A	E3927	3P, PLUG
K5B	E3901	3P HOUSING PLUG
K5D	E3901	3P HOUSING PLUG
Q451A	E4606	SHEET, INSULATION
Q451H	2P00040	H-RADIATOR
VC201	C9046	TRIMMER, 5-40PF
X151	Q6683S	2SA1246(S)
	OR Q6683T	2SA1246(T)
	OR Q6683U	2SA1246
X201	E8332	CRYSTAL, 4.43MHZ OSC.
	OR E8332A	CRYSTAL, 4.43MHZ OSC.
X202	E8318	CERAMIC FILTER, 4.43MHZ TRAP
Z401	317269	HOOK, LEAD WIRE

Ref. No.	Part No.	Description

UE0010B (POWER BOARD BZYA-B)

TRANSISTORS

Q301	Q5053F	2SC536(F)
	OR Q5053G	2SC536(G)
Q302	Q6629Q	2SB774(Q)
	OR Q6683T	2SA1246(T)
	OR Q6683U	2SA1246
	OR Q6629S	2SB774(S)
	OR Q6683S	2SA1246(S)
	OR Q6629R	2SB774(R)
Q303	Q5053G	2SC536(G)
	OR Q5053F	2SC536(F)
Q304	Q6630Z	2SD841
	OR Q6680Z	2SC3087

CAPACITORS

⚠ C301	CFUBM564	MYLAR FILM,0.56MF,+-20%,630V
C304	CCVGM102	CERAMIC,1000PF,+-20%,1KV
C308	C71739A	ELECTROLYTIC,100MF,400V
C310	CFHRK104	MYLAR FILM,0.1MF,+-10%,50V
	OR CFHSK104	MYLAR FILM,0.1MF,+-10%,50V
C312	CEGEM100	ELECTROLYTIC,10MF,35V
C313	CFHBJ104	MYLAR FILM,0.1MF,+-5%,50V
	OR CFHRK104	MYLAR FILM,0.1MF,+-10%,50V
C314	CEFBA470	ELECTROLYTIC,47MF,25V
C315	CCZVK152	CERAMIC,1500PF,+-10%,2KV
	OR CCZWK152	CERAMIC,1500PF,+-10%,2KV
⚠ C317	CCQYM222	CERAMIC,2200PF,+-20%,400V
C320	CCVGM222	CERAMIC,2200PF,+-20%,1KV
C321	C72189A	ELECTROLYTIC,47MF,160V
C322	CEDEA102	ELECTROLYTIC,1000MF,16V
C323	CCVJP472	CERAMIC,4700PF,+100%-0%,1KV
C324	C7208	ELECTROLYTIC,47MF,160V

RESISTORS

R301	RY6WK6R8	WIRE WOUND,6.8 OHM,+-10%,6W
R302	RFBPJ394	CARBON,390K OHM,+-5%,1/2W
⚠ R303	RFBPJ224	CARBON,220K OHM,+-5%,1/2W
⚠ R304	RFACG682	CARBON,6800 OHM,+-2%,1/4W
⚠ R305	RFACG332	CARBON,3300 OHM,+-2%,1/4W
R306	RFACJ182	CARBON,1800 OHM,+-5%,1/4W
R307	RFACJ822	CARBON,8200 OHM,+-5%,1/4W
R308	RFACJ123	CARBON,12K OHM,+-5%,1/4W
R309	RFACJ822	CARBON,8200 OHM,+-5%,1/4W
R310	RFACJ472	CARBON,4700 OHM,+-5%,1/4W
R311	RFACJ120	CARBON,12 OHM,+-5%,1/4W
R312	RFACJ331	CARBON,330 OHM,+-5%,1/4W
R313	RR2FJ2R7	OXIDE METALIZED,2.7 OHM,+-5%,2W
R314	RR2FJ270	OXIDE METALIZED,27 OHM,+-5%,2W

Ref. No.	Part No.	Description
R315	RY6WK390	WIRE WOUND, 39 OHM, +-10%, 6W
⚠ R316	RCBGK565	SOLID, 5600K OHM, +-10%, 1/2W
⚠ R317	RCBGK565	SOLID, 5600K OHM, +-10%, 1/2W
R318	RY2PKR33	WIRE WOUND, 0.33 OHM, +-10%, 2W
R320	RR1FJ102	OXIDE METALIZED, 1K OHM, +-5%, 1W
R321	RR2FJ120	OXIDE METALIZED, 12 OHM, +-5%, 2W
VARIABLE RESISTORS		
⚠ VR301	G0232XDM	1K OHM, B
OR	G0232XDT	1K OHM, B
TRANSFORMERS		
⚠ T301	A5069	CONVERTER
COILS		
⚠ L301	L328	LINE FILTER
⚠ L302	L321	LINE FILTER
L320	L4079	INDUCTOR, 82MH
L321	L4088	INDUCTOR, 150MH
DIODES		
D301	ED0008	RM11C
OR	E1674R	C05-10B
⚠ D305	E1673Z	EQA02-08M3
D306	E1791R	B43-04
OR	E1533R	EU-1
D307	E1264R	1S2095A
D308	E1264R	1S2095A
D309	ED0010	EQA02-09M1, 9V, ZENER
D320	E1490R	ERC25-04
OR	E1616R	RU3M
D321	E1786R	EU2
OR	E1794R	C44-04
MISCELLANEOUS		
⚠ F301	E5062	FUSE, 0.8A
F301AT2	E5740	FUSE CLIP
⚠ F302	E5045	FUSE, 2A, AC
F302AT2	E5740	FUSE CLIP
PS301	E1587P	POSISTOR, PTH451A
Q304B	E4635	SPACER, INSULATION
Q304H	2700058	RADIATOR
Q304M	E4633	INSULATION SHEET

Ref. No.	Part No.	Description
UG0041 (R.G.B. BOARD BMRC)		
TRANSISTORS		
Q1320	Q5183P	2SC945A(P)
OR	Q5183R	2SC945A(R)
OR	Q5183Q	2SC945A(Q)
OR	Q5053E	2SC536(E)
OR	Q5053F	2SC536(F)
OR	Q5053G	2SC536(G)
OR	Q6565G	2SC1815(G)
OR	Q6565Y	2SC1815(Y)
OR	Q6565O	2SC1815(O)
Q1321	Q5077E	2SA608(E)
OR	Q5102R	2SA564(R)
OR	Q5102P	2SA564(P)
OR	Q5102Q	2SA564(Q)
OR	Q5077F	2SA608(F)
Q1330	Q5196E	2SB544(E)
OR	Q5196F	2SB544(F)
Q1350	Q5183P	2SC945A(P)
OR	Q5183Q	2SC945A(Q)
OR	Q5183R	2SC945A(R)
OR	Q5053G	2SC536(G)
OR	Q5053E	2SC536(E)
OR	Q5053F	2SC536(F)
OR	Q6565G	2SC1815(G)
OR	Q6565O	2SC1815(O)
OR	Q6565Y	2SC1815(Y)
Q1360	Q5183P	2SC945A(P)
OR	Q5183R	2SC945A(R)
OR	Q5183Q	2SC945A(Q)
OR	Q5053E	2SC536(E)
OR	Q5053F	2SC536(F)
OR	Q5053G	2SC536(G)
OR	Q6565Y	2SC1815(Y)
OR	Q6565G	2SC1815(G)
OR	Q6565O	2SC1815(O)
Q1361	Q5183P	2SC945A(P)
OR	Q5183Q	2SC945A(Q)
OR	Q5183R	2SC945A(R)
OR	Q5053E	2SC536(E)
OR	Q5053G	2SC536(G)
OR	Q5053F	2SC536(F)
OR	Q6565G	2SC1815(G)
OR	Q6565O	2SC1815(O)
OR	Q6565Y	2SC1815(Y)
Q1362	Q5183R	2SC945A(R)
OR	Q5183P	2SC945A(P)
OR	Q5183Q	2SC945A(Q)
OR	Q5053E	2SC536(E)
OR	Q5053F	2SC536(F)
OR	Q5053G	2SC536(G)
OR	Q6565G	2SC1815(G)
OR	Q6565Y	2SC1815(Y)
OR	Q6565O	2SC1815(O)

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC1300	QC0070	AN5352, TV/R.G.B. SWITCH
CAPACITORS		
C1311	CEHEM1R0	ELECTROLYTIC,1MF,50V
C1312	CEHEM1R0	ELECTROLYTIC,1MF,50V
C1320	CEFAN3R3	NON-POLARIZED ELECTROLYTIC,3.3MF,25V
C1322	CCHBJ270	CERAMIC,27PF,+-5%,50V
C1323	CCHBJ220	CERAMIC,22PF,+-5%,50V
C1327	CEDEM101	ELECTROLYTIC,100MF,16V
C1330	CEDEM470	ELECTROLYTIC,47MF,16V
C1331	CCHJZ103	CERAMIC,0.01MF,+80%-20%,50V
C1332	CEHEM220	ELECTROLYTIC,22MF,50V
C1333	CEHEM1R0	ELECTROLYTIC,1MF,50V
C1360	CCHFK561	CERAMIC,560PF,+-10%,50V
C1361	CCHFK561	CERAMIC,560PF,+-10%,50V
C1362	CCHFK561	CERAMIC,560PF,+-10%,50V
RESISTORS		
R1316	RFACJ102	CARBON,1K OHM,+-5%,1/4W
R1317	RFACJ332	CARBON,3300 OHM,+-5%,1/4W
R1320	RFACJ750	CARBON,75 OHM,+-5%,1/4W
R1321	RFACJ473	CARBON,47K OHM,+-5%,1/4W
R1322	RFACJ223	CARBON,22K OHM,+-5%,1/4W
R1323	RFACJ681	CARBON,680 OHM,+-5%,1/4W
R1324	RFACJ471	CARBON,470 OHM,+-5%,1/4W
R1325	RFACJ681	CARBON,680 OHM,+-5%,1/4W
R1326	RFACJ102	CARBON,1K OHM,+-5%,1/4W
R1327	RFACJ103	CARBON,10K OHM,+-5%,1/4W
R1328	RFACJ223	CARBON,22K OHM,+-5%,1/4W
R1330	RFBPJ220	CARBON,22 OHM,+-5%,1/2W
R1331	RFACJ822	CARBON,8200 OHM,+-5%,1/4W
R1332	RFACJ682	CARBON,6800 OHM,+-5%,1/4W
R1333	RFACJ223	CARBON,22K OHM,+-5%,1/4W
R1334	RFACJ102	CARBON,1K OHM,+-5%,1/4W
R1336	RFACJ103	CARBON,10K OHM,+-5%,1/4W
R1337	RFACJ560	CARBON,56 OHM,+-5%,1/4W
R1338	RFACJ822	CARBON,8200 OHM,+-5%,1/4W
R1339	RFACJ222	CARBON,2200 OHM,+-5%,1/4W
R1340	RFACJ822	CARBON,8200 OHM,+-5%,1/4W
R1341	RFACJ222	CARBON,2200 OHM,+-5%,1/4W
R1342	RFACJ822	CARBON,8200 OHM,+-5%,1/4W
R1343	RFACJ683	CARBON,68K OHM,+-5%,1/4W
R1344	RFACJ472	CARBON,4700 OHM,+-5%,1/4W
R1345	RFACJ124	CARBON,120K OHM,+-5%,1/4W
R1346	RFACJ103	CARBON,10K OHM,+-5%,1/4W
R1350	RFACJ184	CARBON,180K OHM,+-5%,1/4W
R1351	RFACJ683	CARBON,68K OHM,+-5%,1/4W
R1352	RFACJ103	CARBON,10K OHM,+-5%,1/4W
R1360	RFACJ102	CARBON,1K OHM,+-5%,1/4W
R1361	RFACJ102	CARBON,1K OHM,+-5%,1/4W
R1362	RFACJ102	CARBON,1K OHM,+-5%,1/4W
R1370	RFACJ274	CARBON,270K OHM,+-5%,1/4W

Ref. No.	Part No.	Description
VARIABLE RESISTORS		
VR1330	G1119XXH	30K OHM, B
	OR G1119XXM	30K OHM, B
	OR G1119XXB	30K OHM, B
VR1331	G1128XXM	10K OHM, B
	OR G1128XXB	10K OHM, B
	OR G1128XXH	10K OHM, B
VR1332	G1128XXH	10K OHM, B
	OR G1128XXM	10K OHM, B
	OR G1128XXB	10K OHM, B
VR1333	G1128XXH	10K OHM, B
	OR G1128XXM	10K OHM, B
	OR G1128XXB	10K OHM, B
COILS		
L1320	LDAK330	PEAKING, 33UH
DIODES		
D1320	E1121R	1S1555
	OR E1324R	1S2076
	OR E1229R	1S2473
D1327	E1229R	1S2473
	OR E1324R	1S2076
	OR E1121R	1S1555
D1330	E1121R	1S1555
	OR E1324R	1S2076
	OR E1229R	1S2473
D1350	E1229R	1S2473
	OR E1324R	1S2076
	OR E1121R	1S1555
D1360	E1121R	1S1555
	OR E1324R	1S2076
	OR E1229R	1S2473
D1361	E1229R	1S2473
	OR E1324R	1S2076
	OR E1121R	1S1555
D1362	E1121R	1S1555
	OR E1324R	1S2076
	OR E1229R	1S2473
MISCELLANEOUS		
IC1300A	E3252	IC SOCKET, 22PIN
K13K	E3927	3P, PLUG
K13L	E3902	PLUG, 4P HOUSING
K13M	E3903	PLUG, 5P HOUSING

Ref. No.	Part No.	Description

UG0047 (21P SOCKET BOARD BMRF)

RESISTORS

R1300	RFJCJ471	CARBON,470 OHM,+-5%,1/6W
R1301	RFJCJ471	CARBON,470 OHM,+-5%,1/6W
R1310	RFJCJ180	CARBON,18 OHM,+-5%,1/6W
R1311	RFJCJ560	CARBON,56 OHM,+-5%,1/6W
R1312	RFJCJ180	CARBON,18 OHM,+-5%,1/6W
R1313	RFJCJ560	CARBON,56 OHM,+-5%,1/6W
R1314	RFJCJ180	CARBON,18 OHM,+-5%,1/6W
R1315	RFJCJ560	CARBON,56 OHM,+-5%,1/6W

MISCELLANEOUS

SW1300	ES0030	SWITCH, SLIDE
S1300	E3376	21P SOCKET

UG0042 (CONTROL BOARD BMRC)

RESISTORS

R718	RFACJ273	CARBON,27K OHM,+-5%,1/4W
R719	RFACJ682	CARBON,6800 OHM,+-5%,1/4W
R720	RFACJ822	CARBON,8200 OHM,+-5%,1/4W
R721	RFACJ273	CARBON,27K OHM,+-5%,1/4W

VARIABLE RESISTORS

VR711	G5201XXH	10K OHM, B
	OR G5201XXM	10K OHM, B
VR712	G5201XXH	10K OHM, B
	OR G5201XXM	10K OHM, B
VR713	G5003XXH	30K OHM, C
	OR G5003XXM	30K OHM, C
	OR G5003XXT	30K OHM, C
VR714	G5005XXH	20K OHM, B
	OR G5005XXT	20K OHM, B
	OR G5005XXM	20K OHM, B
VR715	G5005XXM	20K OHM, B
	OR G5005XXT	20K OHM, B
	OR G5005XXH	20K OHM, B

MISCELLANEOUS

K7M	E3926A	2P HOUSING PLUG
K7N	E3926A	2P HOUSING PLUG
SW711	ES0030	SWITCH, SLIDE
SW712	ES0030	SWITCH, SLIDE

Ref. No.	Part No.	Description

UG0032 (CRT BOARD BMRC)

TRANSISTORS

Q601	Q6536P	2SC1473NC(P)
	OR Q6541Y	2SC2229
	OR Q65410	2SC2229(O)
	OR Q6536Q	2SC1473NC(Q)
	OR Q6536R	2SC1473NC(R)
	OR Q6531EA	2SC2228A(E)
	OR Q6531DA	2SC2228A(D)
	OR Q6531CA	2SC2228A(C)
Q611	Q6531CA	2SC2228A(C)
	OR Q65410	2SC2229(O)
	OR Q6541Y	2SC2229
	OR Q6536R	2SC1473NC(R)
	OR Q6536Q	2SC1473NC(Q)
	OR Q6536P	2SC1473NC(P)
	OR Q6531EA	2SC2228A(E)
	OR Q6531DA	2SC2228A(D)
Q621	Q6531DA	2SC2228A(D)
	OR Q6536R	2SC1473NC(R)
	OR Q6541Y	2SC2229
	OR Q65410	2SC2229(O)
	OR Q6536P	2SC1473NC(P)
	OR Q6536Q	2SC1473NC(Q)
	OR Q6531EA	2SC2228A(E)
	OR Q6531CA	2SC2228A(C)

CAPACITORS

C602	CCHFK102	CERAMIC,1000PF,+-10%,50V
C612	CCHFK821	CERAMIC,820PF,+-10%,50V
C622	CCHFK102	CERAMIC,1000PF,+-10%,50V
C631	CCZJP102	CERAMIC,1000PF,+100%-0%,2KV
C633	CEMEA100	ELECTROLYTIC,10MF,250V

RESISTORS

R601	RFACJ151	CARBON,150 OHM,+-5%,1/4W
R602	RR2FJ123	OXIDE METALIZED,12K OHM,+-5%,2W
R603	RCBPK272	SOLID,2700 OHM,+-10%,1/2W
R604	RFACJ151	CARBON,150 OHM,+-5%,1/4W
R611	RFACJ151	CARBON,150 OHM,+-5%,1/4W
R612	RR2FJ123	OXIDE METALIZED,12K OHM,+-5%,2W
R613	RCBPK272	SOLID,2700 OHM,+-10%,1/2W
R621	RFACJ151	CARBON,150 OHM,+-5%,1/4W
R622	RR2FJ123	OXIDE METALIZED,12K OHM,+-5%,2W
R623	RCBPK272	SOLID,2700 OHM,+-10%,1/2W
R631	RCBPK274	SOLID,270K OHM,+-10%,1/2W
R632	RR1FJ1R8	OXIDE METALIZED,1.8 OHM,+-5%,1W

VARIABLE RESISTORS

VR601	G1115XGB	5K OHM, B
	OR G1115XGH	5K OHM, B
	OR G1115XGM	5K OHM, B

Ref. No.	Part No.	Description
VR611	G1115XRM	5K OHM, B
	OR G1115XRB	5K OHM, B
	OR G1115XRH	5K OHM, B
VR612	G1126XXB	300 OHM, B
	OR G1126XXM	300 OHM, B
	OR G1126XXH	300 OHM, B
VR621	G1115XBB	5K OHM, B
	OR G1115XBH	5K OHM, B
	OR G1115XBM	5K OHM, B
VR622	G1126XXM	300 OHM, B
	OR G1126XXB	300 OHM, B
	OR G1126XXH	300 OHM, B
MISCELLANEOUS		
K13KST3	E3257	SOCKET, TERMINAL
K6D	361411	HOLDER, LEAD WIRE
K6DS	E3160	TERMINAL SOCKET FOR FOCUS BLOCK
K6F0	361411	HOLDER, LEAD WIRE
K6F0S	E3160	TERMINAL SOCKET FOR FOCUS BLOCK
K600A	E4659	3P, HOUSING
S601	E3324	CRT SOCKET

UE0012 (VR BOARD BZYA)

VARIABLE RESISTORS		
VR651	GS0005XA	B-10K OHM

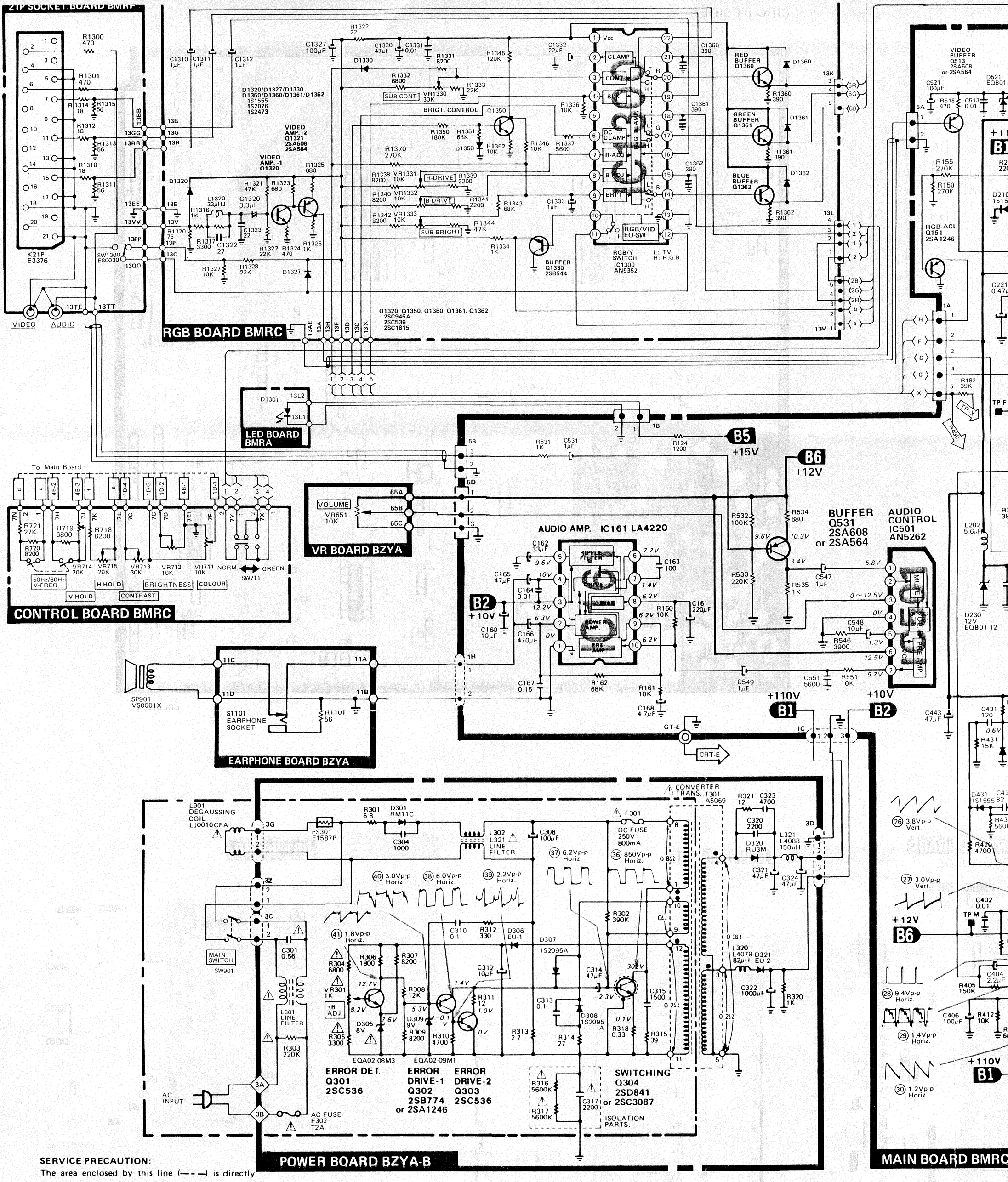
UE0013 (EARPHONE BOARD BZYA)

RESISTORS		
R1101	RFBPJ560	CARBON,56 OHM,+-5%,1/2W
MISCELLANEOUS		
S1101	E7794	EARPHONE JACK

UG0027 (LED BOARD BMRA)

DIODES		
D1301	E1729LA	LED, SLP-136BA

Ref. No.	Part No.	Description
OUT OF CIRCUIT BOARDS		
PICTURE TUBE		
⚠ Q901	Q9331XTH	370KRB22
COILS		
⚠ L901	LJ0010CFA	DEGAUSSING
⚠ L902	D0369ATA	DEFLECTION
	OR D0369XTA	DEFLECTION
MISCELLANEOUS		
K1A	E4643	HOUSING, 5P
K1AST5	E3257	SOCKET, TERMINAL
K1B	E4659	3P, HOUSING
K1BST2	E3257	SOCKET, TERMINAL
K1C	E6053	HOUSING, 3P
K1D	E4642	HOUSING, 4P
K1DST4	E3257	SOCKET, TERMINAL
K1H	E6052	HOUSING, 2P
K13KST4	E3257	SOCKET, TERMINAL
K13L	E4642	HOUSING, 4P
K3C	E6052	HOUSING, 2P
K3D	E6053	HOUSING, 3P
K3Z	E6052	HOUSING, 2P
K4B	E4641	3P MINI HOUSING
K4BST3	E3257	SOCKET, TERMINAL
K5A	E4659	3P, HOUSING
K5AST2	E3257	SOCKET, TERMINAL
K5B	E4641	3P MINI HOUSING
K5BST2	E3257	SOCKET, TERMINAL
K5D	E4641	3P MINI HOUSING
K5DST3	E3257	SOCKET, TERMINAL
N0	E6051	HOUSING, 1P
N02	E6051	HOUSING, 1P
N06	J7183F	LEAD WITH PLUG
Q901P	D4108X	CG PURITY MAGNET
	OR D4108A	CG PURITY MAGNET
SP901	VS0001X	SPEAKER
⚠ SW901	ES0004A	PUSH SWITCH
W901	E6059KB	AC POWER CORD
W902	J1906A	CRT GROUNDING LEAD
J901	JT0024	RCA, 21P JACK BOARD



SERVICE PRECAUTION:
The area enclosed by this line (— — —) is directly connected with AC Mains Voltage. When servicing the area, connect an isolating transformer

COLOUR DATA DISPLAY

80P Chassis Series

SERVICE REF. No. CD 3185A-00

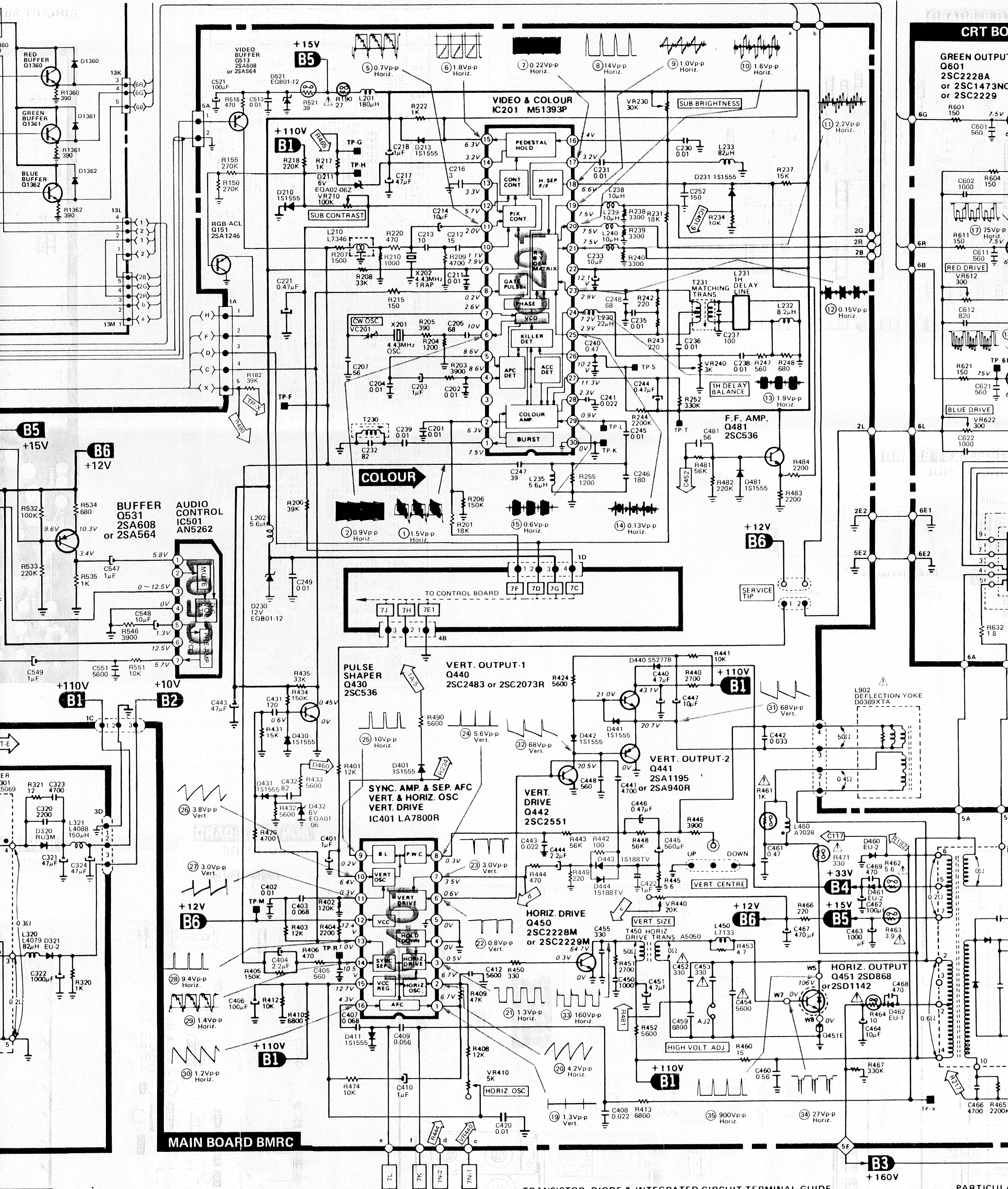
Part No. 3P01574 BMRF

PRODUCT SAFETY NOTICE

Product safety should be considered when a component replacement is made in any area of a set. Components indicated by a mark ⚠ in this circuit diagram show components whose value have special significance to product safety. It is particularly recommended that only parts specified on the parts list of service manual be used for components replacement pointed out by the mark.

CIRCUIT DIAGRAM NOTES:

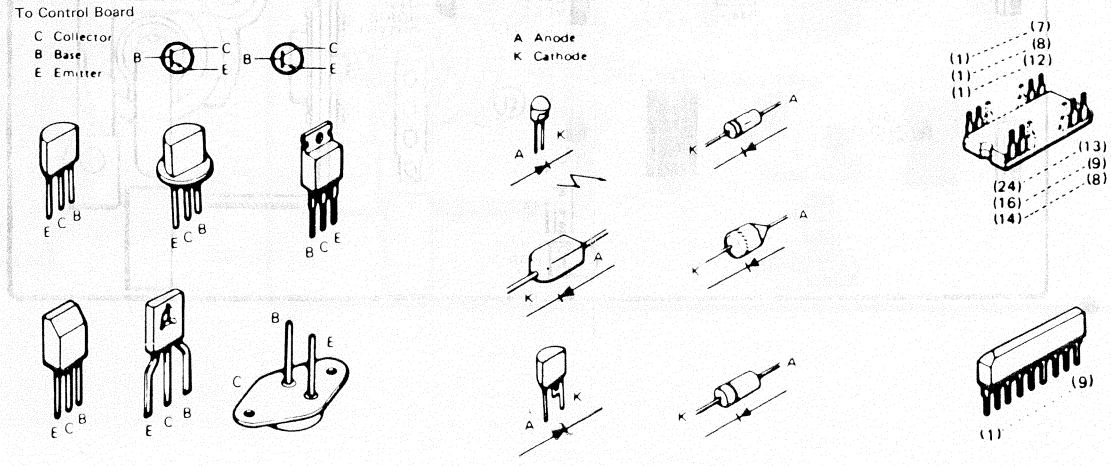
1. All resistance values in ohms K = 1,000, M = 1,
2. Unless otherwise noted in circuit diagram all ca
   than 1 are expressed in μF, and the values more
3. Voltage reading taken with "VOM" from p
   chassis ground.
   Voltage reading taken using colour bar signa
   normal, AFC switch in "OFF" position. Some
   with signal strength.
4. Waveforms were taken with colour bar signal and
   for normal picture. Waveforms were taken u
   oscilloscope and low capacity probe.
5. All resistance values for transformers must b
   unwired condition.
6. This circuit diagram covers basic or represent
   There may be some component or partial
   between actual chassis and circuit diagram.



CIRCUIT DIAGRAM NOTES:

1. All resistance values in ohms K = 1,000, M = 1,000,000.
2. Unless otherwise noted in circuit diagram all capacitor values less than 1 are expressed in μF, and the values more than 1 are in pF.
3. Voltage reading taken with "VOM" from point indicated to chassis ground.
   Voltage reading taken using colour bar signal, all controls at normal, AFC switch in "OFF" position. Some voltage may vary with signal strength.
4. Waveforms were taken with colour bar signal and controls adjusted for normal picture. Waveforms were taken using a wide band oscilloscope and low capacity probe.
5. All resistance values for transformers must be measured under unwired condition.
6. This circuit diagram covers basic or representative chassis only. There may be some component or partial circuit difference between actual chassis and circuit diagram.

TRANSISTOR, DIODE & INTEGRATED CIRCUIT TERMINAL GUIDE



VIDEO & COLOUR
IC201 M51393P

CRT BOARD BMRC

GREEN OUTPUT
Q601
2SC2228A
or 2SC1473NC
or 2SC2229

RED OUTPUT
Q611
2SC2228A
or 2SC1473NC
or 2SC2229

BLUE OUTPUT
Q621
2SC2228A
or 2SC1473NC
or 2SC2229

PICTURE TUBE
370KRB22

VERT. OUTPUT-1
Q440
2SC2483 or 2SC2073R

VERT. OUTPUT-2
Q441
2SA1195
or 2SA940R

SYNC. AMP. & SEP. AFC
VERT. & HORIZ. OSC
VERT. DRIVE
IC401 LA7800R

VERT.
DRIVE
Q442
2SC2551

HORIZ. DRIVE
Q450
2SC2228M
or 2SC2229M

HORIZ. OUTPUT
Q451 2SD868
or 2SD1142

F.F. AMP.
Q481
2SC536

L902
DEFLECTION YOKE
D0369XTA

T460
FLYBACK TRANS.

SCREEN
& FOCUS
CONTROL
BLOCK
R0155XH

TRANSISTOR, DIODE & INTEGRATED CIRCUIT TERMINAL GUIDE

C Collector
B Base
E Emitter

A Anode
K Cathode

PARTICULAR PARTS SYMBOL

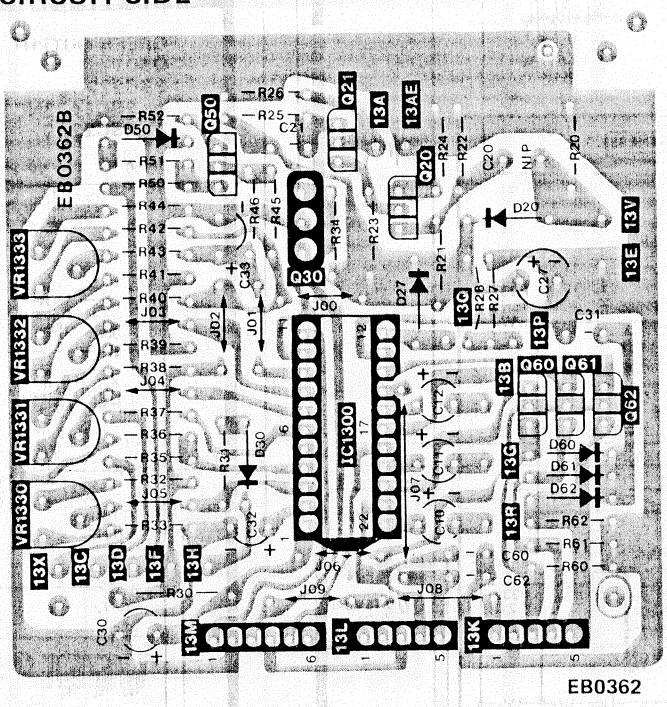
Fusible Resistor

Non-Pole Electrolytic Capacitor

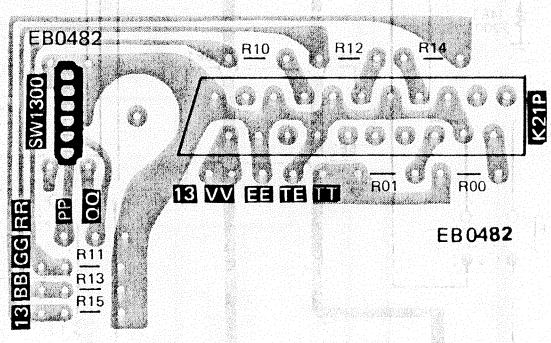
Thermistor

Posistor

R.G.B. BOARD
CIRCUIT SIDE



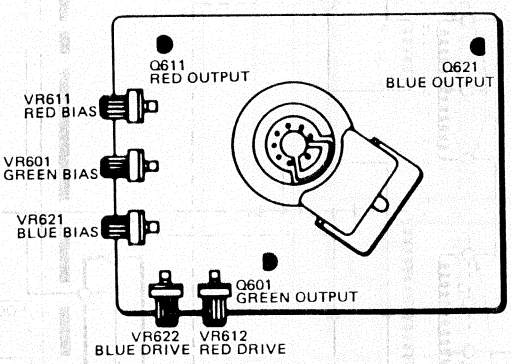
21P SOCKET BOARD
CIRCUIT SIDE

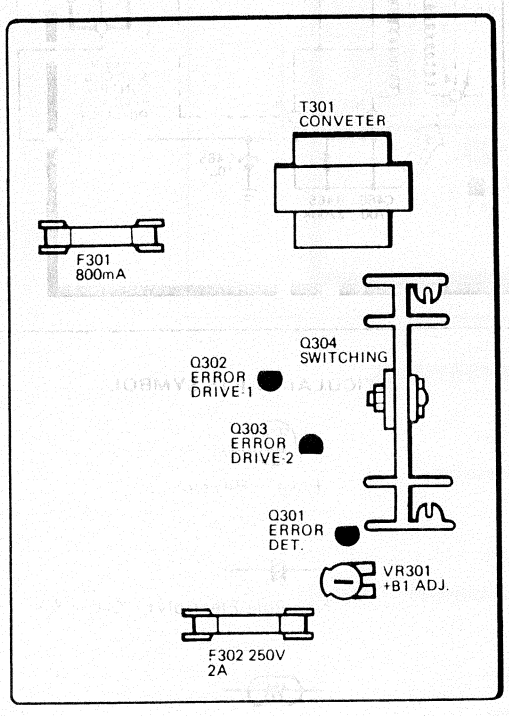


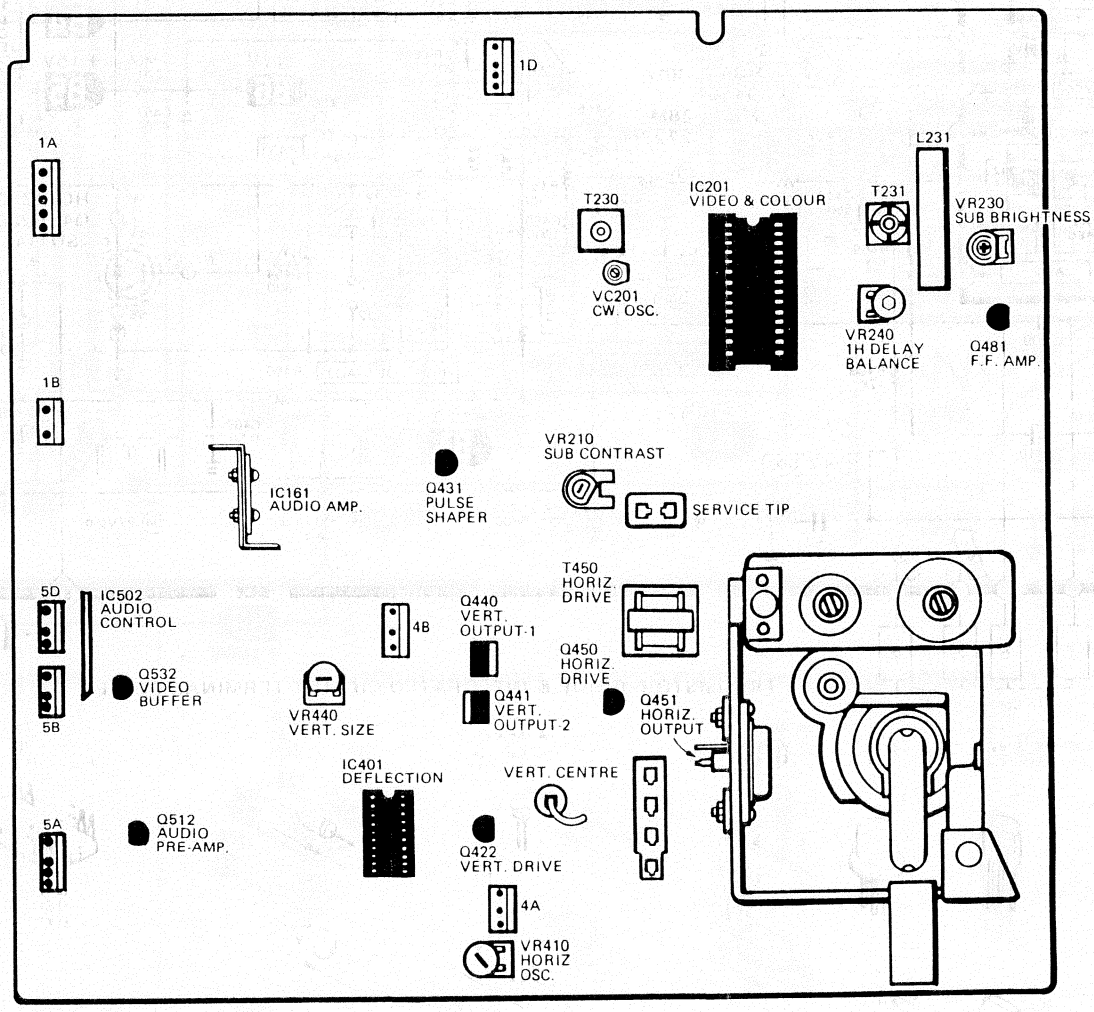
EB0482

PIN	IC Q D	C			R			VR T VC X	L
1D		117				201	122		
1Q				249	206	231			L202
	D230				109	121	109	VR101	L201
	D101					136			
					213				
TP-F		240			252				
					244				
		244					108		
	D111						120	X131	L102
			124	123					
			201	128			137		L235
		246			255	111			
TP-X		247	230	102		132			L101
TP-K	Q201	245	132		243	133		T132	L131
TP-T		237	133	101	242				
TP-C		229	232	100			131		L104
TP-E			239	115				T101	L103
TP-L		204	202	103			212	T231	L231
1J								T230	
TP-S	Q101	241	131	113			200	T131	
1A			203	114			134	VR230	
TP-D		248		104	208		203		
			205	111			102		
	D481	236	211	110			104	T133	L230
	IC101		136	125			103	VC201	
TP-B	IC201	206	134	122	482	204		X201	
		211		109			205	T102	
1P		233	153	108			150	VR240	L105
	Q481		154	152	215				L232
		212	155		247			X151	L233
		252	156	126	248	153		X101	L201
TP-P		481		151		209		X202	L107
TP-Q			214	173	481		150	T151	L238
		231	213	172	484		151		L239
			175		235	210	125		L240
2L			157		236	159	126		L236
2B	Q181		159	158	483	158	124		
1B	D231		216	171	237	435			L203
2G	Q431		218	161		207	521		
2E2	D213		433			211	185		
	D210			163	238	222	186		
	D430	462		549	239	434	160		
	D211	463	217	168	240	233	161		
	D432			164	234	431	188		
	D171				463	432	162	VR210	
	IC161		431	162			170		
	D431	469		174			183		
			432	165	462	440	184		
TP-G	D460	465		181		466			
TP-H	D461		451	160		441			
1H	IC181			167			187		
				166	217	433	181		
						218	182		
				513		424	420		
5D	Q440		446			452			
1C	D440		455				546	T450	
4B	IC502		447				518		
	D443		450				537		
5E2	Q513			546					
	Q450	466	440		465	448	536		
	Q532	459			453	445	405	T460	
5B	D444		448	404		451	545	VR440	L450
5A	D441			548		422	543		
5C				547					
5F			467	543					
GT-E	D442		442			450			
				541					
	Q441	452	444	402		401	542		
				501		449	406		L501
	D462		441	531		443	403		
	IC501		442	542		447	404		
				403	464	444	503		
TP-M	Q442	464	443	545	467	446	502		
		468		532			501		
			448	405		402	531		
	IC401	454	401	413		413	511		
			412			534	533		
TP-R						535	532		
5A		453			410	541			
DY		455	420	409		409	411		
						461	517		
			411	514			513		
5C		471	410	407		407	514		L460
4A	Q472	460				408	512		
	D411		461						
	Q471			521	471	476	515		
5S	D521		470	512	460	473	516		
	D471		414	406		474	472		
				511					
	D522							VR410	

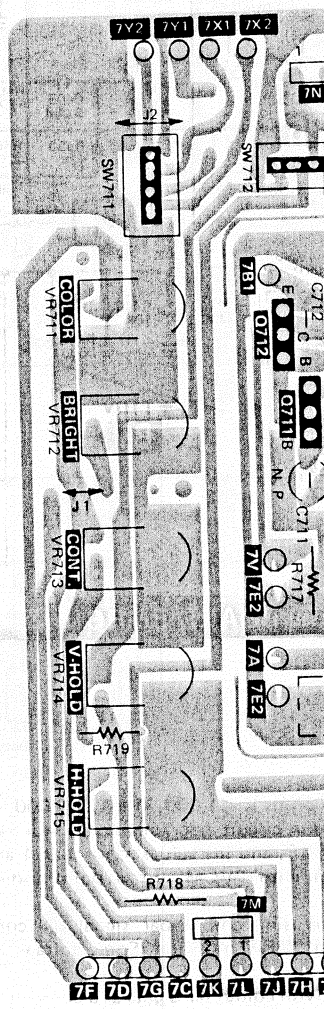
COMPONENT LOCATION







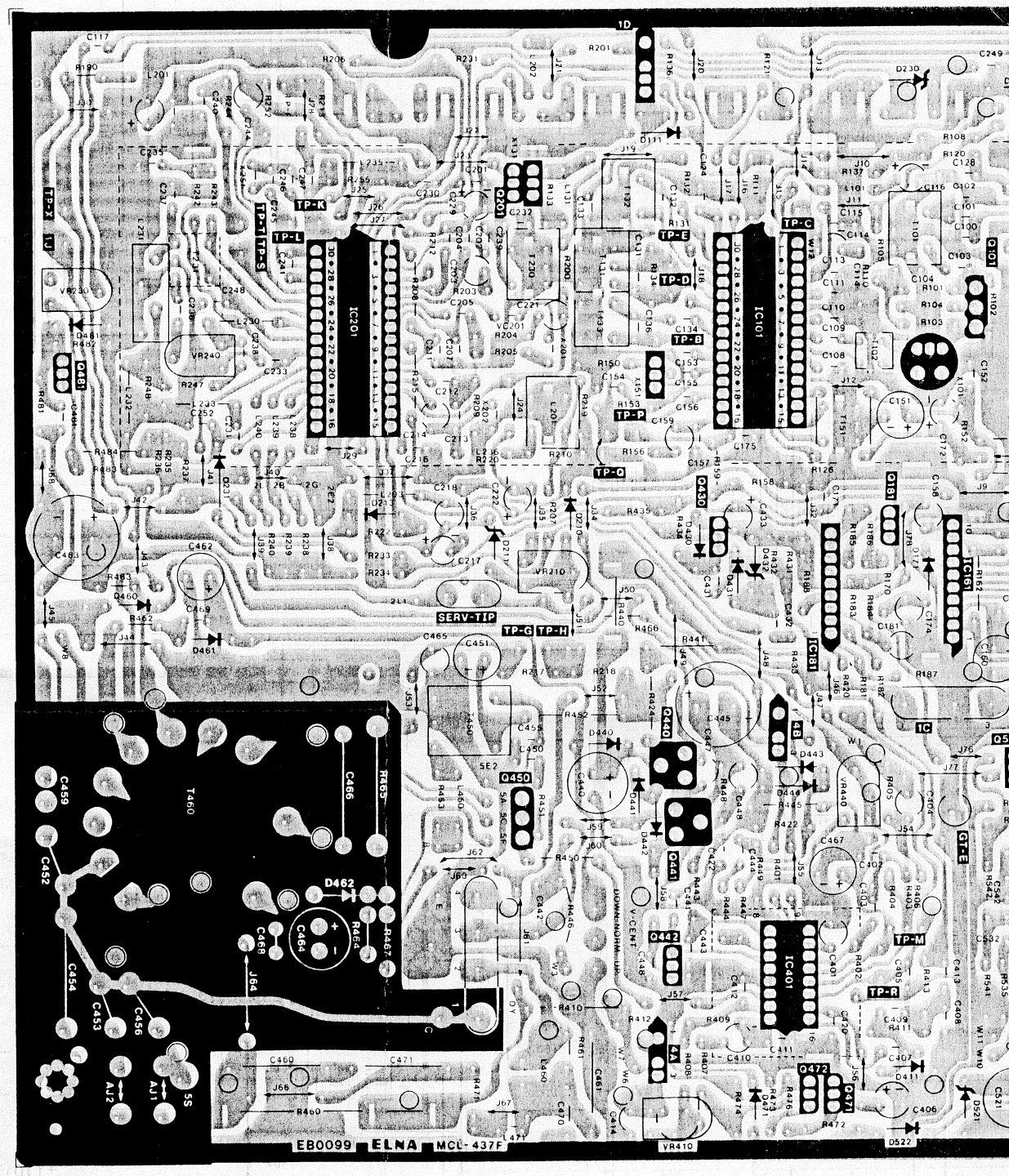
CONTROL BOARD
CIRCUIT SIDE



COMPONENT LOCATION DIAGRAM

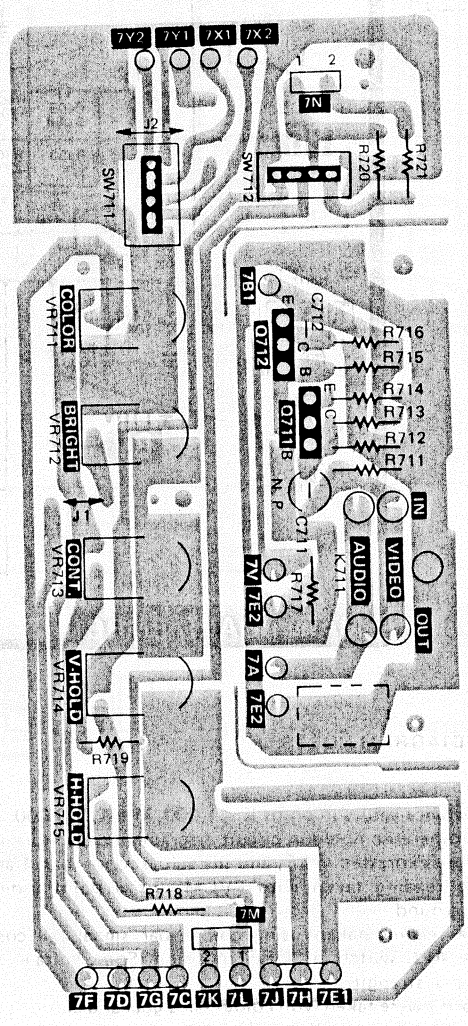
PIN	IC Q D	C			R			VR T VC X	L
1D		117				201	122		
1Q				249	206	231			L202
	D230				109	121	109		L201
	D101					136		VR101	
					213				
TP-F		240			252				
					244				
		244					108		L102
	D111						120	X131	
			124	123					L235
		246	201	128	255	111	137		
TP-X		247	230	102		132			L101
TP-K	Q201	245	132		243	133		T132	L131
TP-T		237	133	101	242				
TP-C		229	232	100		131			L104
TP-E			239	115				T101	L103
TP-L		204	202	103		212	105	T231	L231
1J			131	113		200		T230	
TP-S	Q101	241	203	114	208	134	110	T131	
1A		248		104		203	101	VR230	
TP-D			205	111			102		
		236	211	110			104	T133	L230
	D481		136	125		204	103	VC201	
	IC101								
TP-B	IC201	206	134	122	482			X201	
		211		109		205		T102	
1P		233	153	108		150		VR240	L105
			154		215				L232
	Q481	212	155	152	247			X151	L233
		252	156	126	248	153		X101	L201
TP-P		481		151		209	150	X202	L107
TP-Q			214	173	481		151	T151	L238
		231	213	172	484				L239
			175		235	210	126		L240
2L			157		236	159	124		L236
2B	Q181		159	158	483	158			
1B	D231		216	171	237	435			L203
2G	Q431		218			207	521		
2E2	D213		433	161		211	185		
	D210			163		222	186		
	D430	462		549	238	434	160		
	D211	463	217	168	239	233	161		
	D432				240	431	188		
	D171			164	234	432	162	VR210	
	IC161		431	162	463		170		
	D431			174			183		
		469		165	462	440	184		
	D460		432	181		466			
TP-G	D461	465		160		441			
TP-H	IC181		451	167			187		
1H				166		433	181		
					217	218	182		
						424	420		
				513		452			
5D	Q440		446				546	T450	
1C	D440		455						
4B	IC502		447				518		
	D443		450				537		
5E2	Q513			546					
	Q450	466	440		465		536		
	Q532	459			453	448	405	T460	
5B	D444					445	545	VR440	L450
5A			448	404		451			
5C	D441			548			543		
5F				547		422			
GT-E	D442		467	543					
			442			450			
	Q441	452	444	541					
				402		401	542		
	D462			501		449	406		L501
	IC501		441	531		443	403		
			442	542		447	404		
				403	464	444	503		
TP-M	Q442	464	443	545	467	446	502		
		468		532			501		
			448	405		402	531		
	IC401	454	401	413		413	511		
			412			534	533		
TP-R					410	535	532		
5A		453				541			
DY		455	420	409		409			
						461	411		
							517		
5C		471	411	514			513		
4A	Q472	460	410	407		407	514		L460
	D411					408	512		
	Q471		461						
5S				521	471	476	515		
	D521		470	512	460	473	516		
	D471		414	406		474	472		
				511					
	D522							VR410	

CIRCUIT SIDE



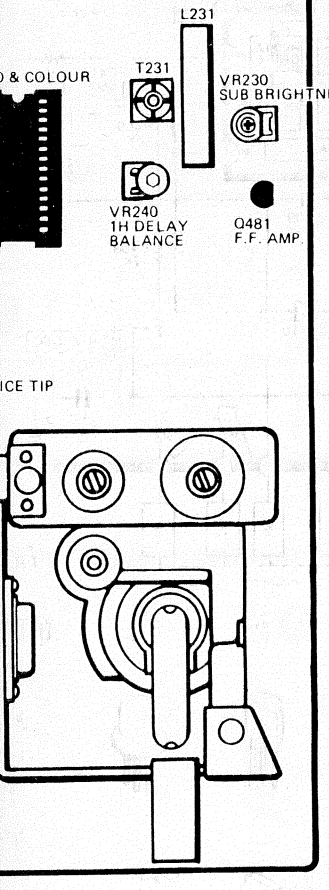
CONTROL BOARD

CIRCUIT SIDE



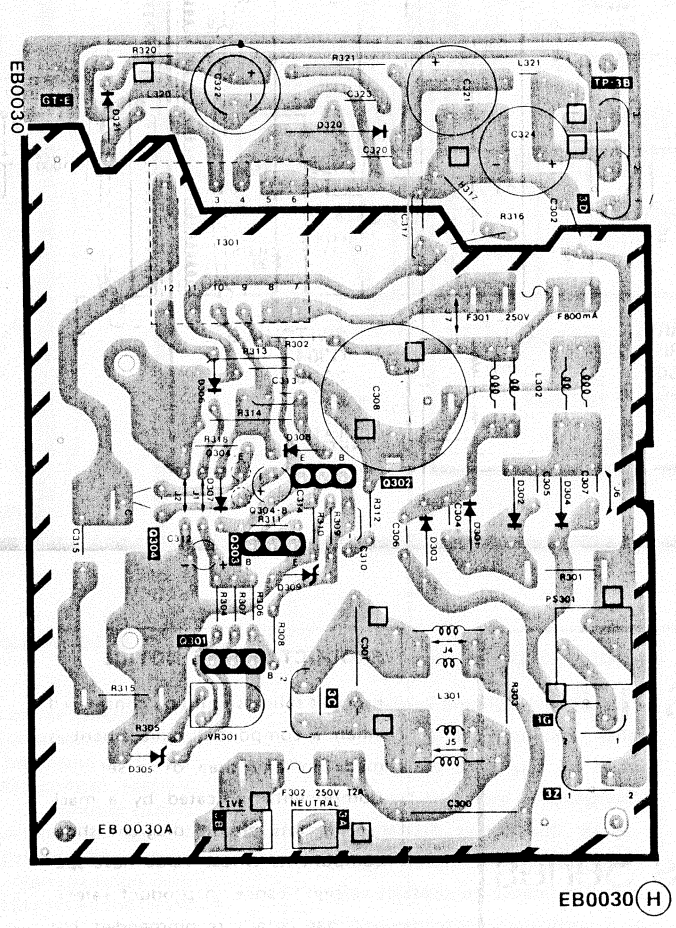
EB0295 (C)

& COLOUR



POWER BOARD

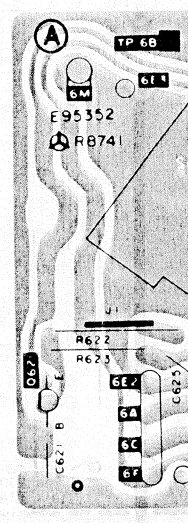
CIRCUIT SIDE



EB0030 (H)

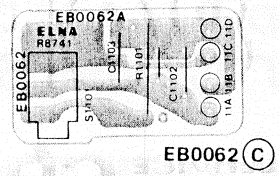
CRT BOARD

COMPONENT



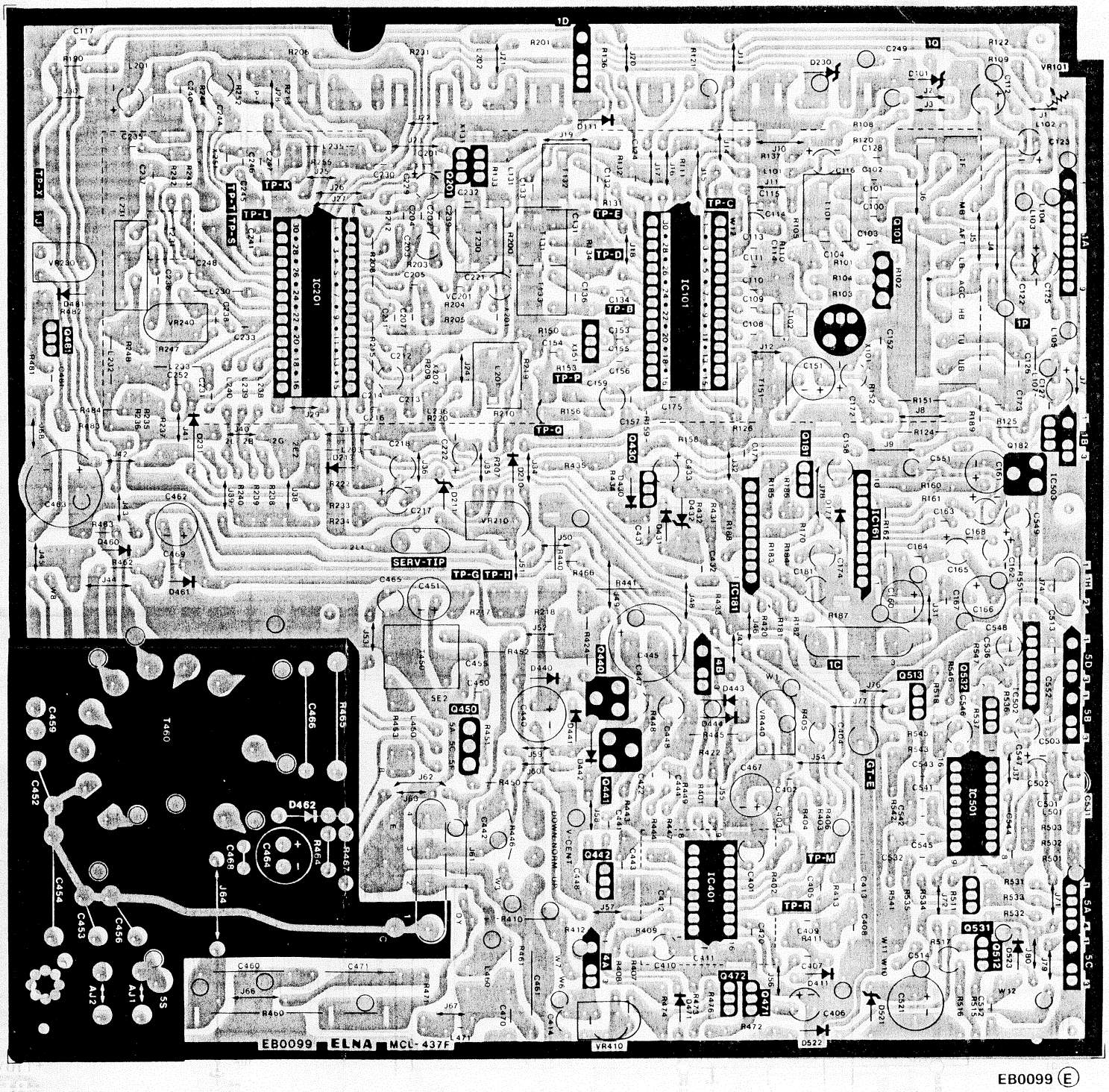
EARPHONE BOARD

COMPONENT SIDE



EB0062 (C)

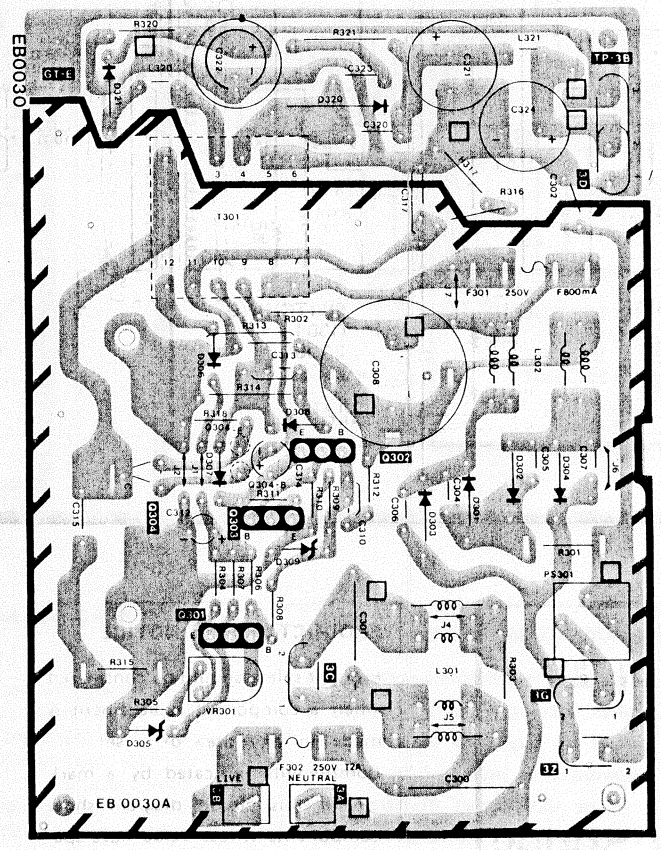
CIRCUIT SIDE



EB0099 (E)

POWER BOARD

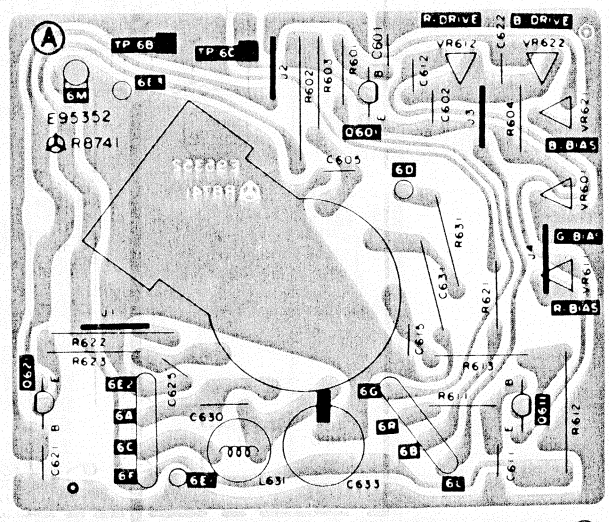
CIRCUIT SIDE



EB0030 (H)

CRT BOARD

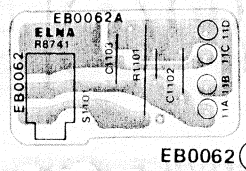
COMPONENT SIDE



E95359 (A)

EARPHONE BOARD

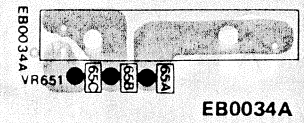
COMPONENT SIDE



EB0062 (C)

VR BOARD

COMPONENT SIDE



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